

July 2001

# NUCLEAR REGULATION

## Progress Made in Emergency Preparedness at Indian Point 2, but Additional Improvements Needed

**G A O**Accountability \* Integrity \* Reliability

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Report Documentation Page		
<b>Report Date</b> 00JUL2001	<b>Report Type</b> N/A	<b>Dates Covered (from... to)</b> -
<b>Title and Subtitle</b> NUCLEAR REGULATION: Progress Made in Emergency Preparedness at Indian Point 2, but Additional Improvements Needed	<b>Contract Number</b>	
	<b>Grant Number</b>	
	<b>Program Element Number</b>	
<b>Author(s)</b>	<b>Project Number</b>	
	<b>Task Number</b>	
	<b>Work Unit Number</b>	
<b>Performing Organization Name(s) and Address(es)</b> U.S. General Accounting Office P.O. Box 37050 Washington, DC 20013	<b>Performing Organization Report Number</b> GAO-01-605	
<b>Sponsoring/Monitoring Agency Name(s) and Address(es)</b>	<b>Sponsor/Monitor's Acronym(s)</b>	
	<b>Sponsor/Monitor's Report Number(s)</b>	
<b>Distribution/Availability Statement</b> Approved for public release, distribution unlimited		
<b>Supplementary Notes</b>		
<b>Abstract</b> <p>In February 2000, Consolidated Edison Company shut down the Indian Point 2 commercial nuclear power plant in New York State because a tube had ruptured in a steam generator, raising the possibility that radioactively contaminated water could leak into the environment. 1 In this particular instance, the total amount of radioactivity released posed no threat: It was about one thousandth of the dose an individual receives from a chest X-ray. However, in the event of a more serious emergency at Indian Point 2, protecting the public from a radioactive release presents more substantial challenges because the plant is located in a heavily populated area. More than 280,000 people reside within 10 miles of the plant in four counties; millions more live in New York City about 25 miles distant and within 50 miles in Connecticut, New Jersey, New York, and Pennsylvania. Other commercial nuclear power plants are generally located in less-populated areas.</p>		
<b>Subject Terms</b>		
<b>Report Classification</b> unclassified	<b>Classification of this page</b> unclassified	
<b>Classification of Abstract</b> unclassified	<b>Limitation of Abstract</b> SAR	

<b>Number of Pages</b>
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## Abbreviations

FEMA Federal Emergency Management Agency  
NRC Nuclear Regulatory Commission



United States General Accounting Office  
Washington, DC 20548

July 30, 2001

#### Congressional Requesters

In February 2000, Consolidated Edison Company shut down the Indian Point 2 commercial nuclear power plant in New York State because a tube had ruptured in a steam generator, raising the possibility that radioactively contaminated water could leak into the environment.<sup>1</sup> In this particular instance, the total amount of radioactivity released posed no threat: It was about one thousandth of the dose an individual receives from a chest X-ray. However, in the event of a more serious emergency at Indian Point 2, protecting the public from a radioactive release presents more substantial challenges because the plant is located in a heavily populated area. More than 280,000 people reside within 10 miles of the plant in four counties; millions more live in New York City—about 25 miles distant—and within 50 miles in Connecticut, New Jersey, New York, and Pennsylvania. Other commercial nuclear power plants are generally located in less-populated areas.

To protect the public if a commercial nuclear power plant accidentally releases radiation to the environment, the responsible regulatory agency, the Nuclear Regulatory Commission (NRC), requires the utility to prepare and NRC to approve a radiological emergency preparedness plan. The on-site plan describes what is to be done in an emergency, how it is to be done, and who is to do it. Among other things, the plan identifies the process for notifying and communicating with the utility's own personnel as well as with state, federal, and local agencies and the media during an emergency. The plan also identifies the circumstances and actions, such as providing shelter or evacuating the local population, the utility would recommend that off-site officials take to protect the public. NRC conducts inspections to ensure that the utility can effectively implement the on-site plan.

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<sup>1</sup>Steam generators are one of two major systems used to convert heat into electrical power for industrial and residential use. Heat from the plant's fuel is transferred through pipes to the steam generator. The steam produced by the generator is transferred to the turbines, where it is converted into electricity. App. I shows one of the four steam generators in relation to other systems within a plant and the locations where a leak could release radioactive material to the environment.

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In addition, the Federal Emergency Management Agency (FEMA) is responsible for ensuring that state and local communities develop emergency preparedness plans to address the off-site impacts of a nuclear emergency. FEMA also oversees the conduct of periodic exercises to determine whether the off-site response would adequately protect public health and safety. In New York State, the counties are responsible for protecting public health and safety during a natural, radiological, or other disaster, except when the governor declares a state of emergency. The four counties that have major responsibilities for responding to an emergency at Indian Point 2 are Westchester, Rockland, Putnam, and Orange. Because of the number of parties involved both on- and off-site, good communication is essential to prepare for and respond to a radiological emergency.

Concerned about the safety of the communities near Indian Point 2, you asked us to examine the emergency preparedness issues associated with the plant. Specifically, this report describes the (1) emergency preparedness weaknesses at the plant and the actions that Consolidated Edison has taken to resolve them, (2) lessons learned by the four Indian Point counties from the February 2000 event, and (3) suggestions offered by the counties to improve the radiological emergency preparedness process beyond the actions already taken.

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## Results in Brief

Over the years, NRC had identified a number of emergency preparedness weaknesses at Indian Point 2 that had gone largely uncorrected. For example, in 1998 and again in 1999, NRC identified several communication weaknesses, including delays in activating the pagers used to alert the utility's staff about an emergency. Consolidated Edison had some actions under way to correct emergency preparedness weaknesses before the February 2000 event and initiated others to address the problems that occurred during it. However, according to an April 2001 NRC inspection report, the actions had not been fully effective. With respect to the aforementioned communications weaknesses in particular, in evaluating Consolidated Edison's response to the February 2000 emergency, NRC found that critical personnel were not notified in a timely fashion, which delayed the staffing and operation of the on-site emergency response facility. NRC found that this occurred because the process to activate the pagers was complex and not well understood and that Consolidated Edison had acted without diagnosing the underlying causes of the problems. As a result, NRC found emergency preparedness problems similar to those it had identified before and during the February 2000 event. Despite the weaknesses identified, in commenting on a draft of this



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report, NRC noted that Consolidated Edison's emergency preparedness program could protect the public.

The four counties in New York State that are responsible for responding to a radiological emergency at Indian Point 2 have strengthened their emergency preparedness programs as a result of the lessons learned from the February 2000 event. These lessons included the need for better coordination between the counties in responding to a radiological emergency and in providing the media with information. Another important lesson learned was the need to improve communication during an emergency between Consolidated Edison and the counties about the extent of the problems and their potential impact on the public. This lesson resulted in one important change to improve communications among the state, counties, and Consolidated Edison. In partnership, they revised the form that Consolidated Edison used to provide information on whether radiation was released from the plant. Although the February 2000 event posed no danger to the public, Consolidated Edison had not clearly communicated with the state and counties about whether a radioactive release had occurred and its magnitude. Consolidated Edison reported that a radioactive release had occurred but that this release posed no danger to the public; county officials reported that no release had occurred. This contradictory information led to credibility problems with the media and the public. The form now clearly shows whether a release has occurred.

Beyond the actions already taken by Consolidated Edison and the counties to improve their emergency response programs, county officials suggested changes that would improve communications among NRC, FEMA, and nonstate entities. In particular, county officials said that since they are responsible for radiological emergency preparedness for Indian Point 2, NRC and FEMA should communicate directly with them during nonemergency situations. In New York and 16 other states—where more than half of the nation's 103 operating nuclear power plants are located—counties or other local governments are responsible for radiological preparedness, but NRC and FEMA communicate primarily with the states and rely on the states to communicate with local jurisdictions. In response to the counties' suggestion, NRC said that meeting with local officials would be resource intensive, and FEMA said that some states limit it from communicating with local officials. However, NRC has not assessed the costs and benefits of routinely meeting with local officials, and FEMA's method of communicating with the states has not been effective in providing the four counties with information on various initiatives that will affect their radiological emergency preparedness programs. Given that

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effective communication is critical to prepare for and respond to a radiological emergency, we are recommending that NRC and FEMA reassess their policies for communicating primarily with the state in those instances where other entities have a major role for responding to a radiological emergency. In commenting on a draft of this report, NRC said that it did not have the resources to routinely communicate with 160 counties, and FEMA said that it expects to increase its interactions with local officials in the coming years.

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## Background

Emergency plans for commercial nuclear power plants are intended to protect public health and safety whenever plant accidents cause radiation to be released to the environment. Since the March 1979 accident at the Three Mile Island nuclear power plant in Pennsylvania, significantly more attention has been focused on emergency preparedness. For example, the NRC Authorization Act for Fiscal Year 1980 established a requirement for off-site emergency planning around nuclear power plants and allowed NRC to issue a nuclear plant operating license only if it determines that there exists either a

- related state or local emergency preparedness plan that provides for responding to accidents at the specific plant and complies with NRC's emergency planning guidelines or
- state, local, or utility plan that provides reasonable assurance that public health and safety is not endangered by the plants' operation in the absence of a related state or local emergency preparedness plan.

In November 1980, NRC and FEMA published regulations that provided the criteria for radiological emergency plans. The regulations include 16 emergency standards—15 related to both on- and off-site safety and 1 related solely to on-site safety—and require that emergency plans be prepared to cover the population within a 10-mile radius of a commercial nuclear power plant. In addition, state plans are required to address measures necessary to deal with the potential for the ingestion of radioactively contaminated foods and water out to a radius of 50 miles. The 10-mile and 50-mile radii are called “emergency planning zones.” NRC and FEMA have supplemented the criteria several times since November 1980, most recently in July 1996 when the agencies endorsed the prompt evacuation of the public within a 2-mile radius and about 5 miles downwind of the plant, rather than sheltering the public, in the event of a severe accident.

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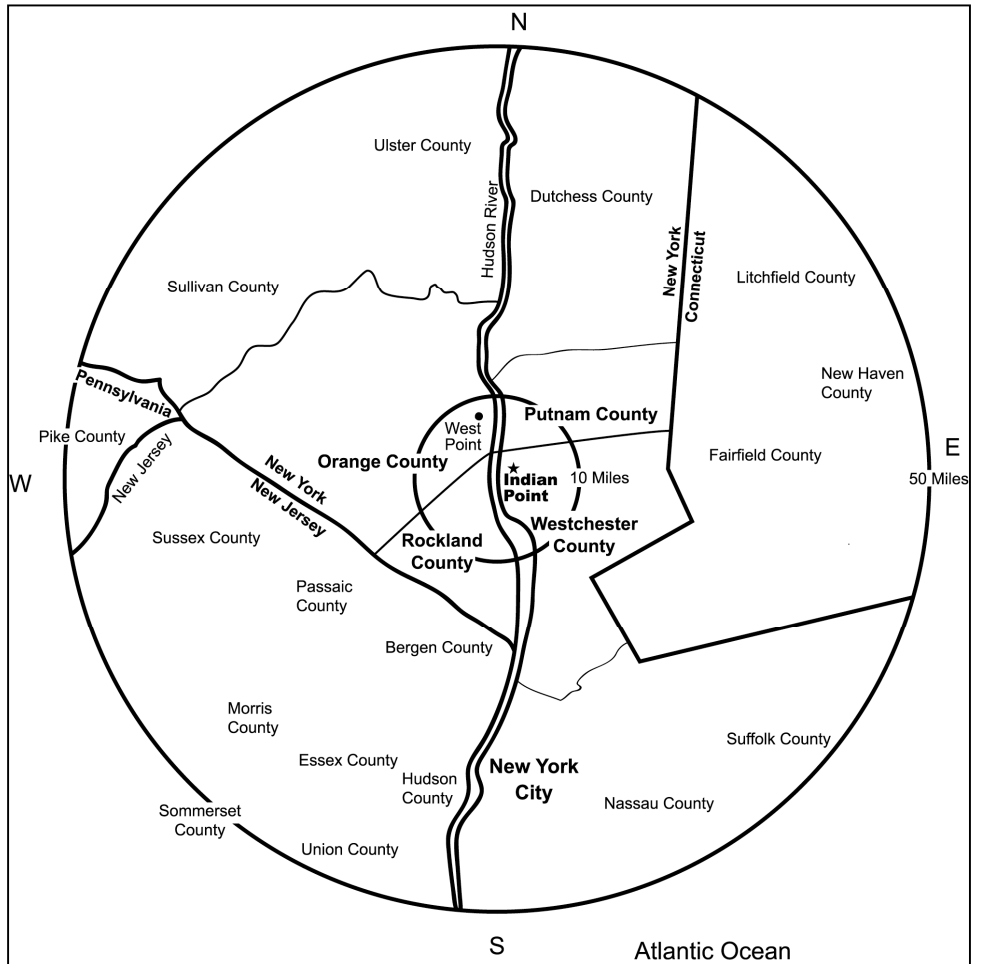
NRC has established four emergency classification levels in order of increasing concern—*unusual events, alerts, site-area emergencies, and general emergencies*. A "general emergency" involves the actual or imminent substantial degradation of the plant with the potential for a significant release of radiation to the environment. The emergency at Indian Point 2 was an "alert," which is a low-level event that poses no threat to public health and safety. Appendix II describes the emergency action levels and provides examples of plant conditions that could lead to an emergency. Since 1981, NRC's data show that utilities reported at least 2,500 unusual events, 140 alerts, 6 site-area emergencies, and no general emergencies.

FEMA and the affected state and local governments within the 10-mile emergency planning zone conduct exercises at least every 2 years at each nuclear power plant site. In addition, each state with a nuclear power plant must conduct an exercise at least every 6 years within the 50-mile zone. The Indian Point site has two operating plants with different licensees—Consolidated Edison and Entergy. As a result, the practice has been to alternate the off-site biennial exercises between the two plants. Therefore, FEMA conducts an off-site exercise for Indian Point 2 every 4 years. Later this year, Entergy expects to assume ownership of Indian Point 2. Under federal regulations, each licensee must participate in a biennial off-site exercise every 2 years. Since Entergy would own both plants on the site once NRC approves the transfer, NRC said that the practice of alternating the off-site exercises will not be necessary.

The state of New York has three nuclear power plant sites, and FEMA conducts a 50-mile exercise at one of the three sites every 6 years. Therefore, FEMA would conduct a 50-mile exercise for the Indian Point site only once every 18 years. The purpose of the exercises is to test the integrated capabilities of appropriate state and local government agencies, utility emergency personnel, and others to verify their capability to mobilize and respond if an accident occurred. Before the exercises, generally, FEMA and state officials not involved in them agree to the accident scenarios and the aspects of emergency preparedness that will be tested.

In addition, NRC requires utilities to conduct exercises of the plant's on-site plan during the interval between the biennial exercises. According to NRC staff, the utilities usually conduct their exercises as part of FEMA's biennial exercises. Figure 1 shows the 10- and 50-mile emergency planning zones for Indian Point 2.

**Figure 1: 10- and 50-Mile Emergency Planning Zones for Indian Point 2**



Note: The U.S. Military Academy at West Point, with a resident population of about 9,000, is located within the 10-mile emergency planning zone in Orange County. Since the Academy is a Department of Defense facility, it is exempt from state and local emergency planning requirements. However, the Academy is connected to the emergency communication system that links Indian Point 2 with state and local officials.

Source: Developed by GAO from maps obtained from Consolidated Edison.

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## Consolidated Edison Has Taken Actions to Resolve Emergency Preparedness Weaknesses, but More Needs to Be Done

Over the years, NRC has identified a number of emergency preparedness weaknesses at Indian Point 2 that have gone largely uncorrected and made Consolidated Edison's response during the February 2000 event less than satisfactory. For example, in 1998 and again in 1999, NRC identified several communication weaknesses, including delays in activating the pagers used to alert the utility's staff about an emergency. In evaluating Consolidated Edison's response to the emergency, NRC found that the notification of critical personnel was delayed, which delayed the staffing and operation of the on-site emergency response facility. This occurred because the process to activate the pagers was complex and not well understood. Consolidated Edison already had actions under way to correct emergency preparedness weaknesses before the February 2000 event and initiated others to address the problems that occurred during it. However, these efforts have been ineffective and incomplete. As a result, in an April 2001 inspection report, NRC identified emergency preparedness weaknesses similar to those that occurred before and during the February 2000 event.

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## Ineffective Corrective Actions Resulted in Repeat Inspection Findings Before the February 2000 Event

Beginning in 1996, NRC identified numerous weaknesses with the emergency preparedness program at Indian Point 2. NRC found, for example, that Consolidated Edison was not training its emergency response staff in accordance with procedures and some individuals had not taken the annual examination and/or participated in a drill or exercise in a 2-year period as required. In response, Consolidated Edison disciplined the individuals responsible, developed an improved computer-based roster containing the current status of the training requirements for emergency response personnel, and instituted a process to distribute training modules to those employees prior to the expiration of their qualifications.

Although NRC cited Consolidated Edison for the training weaknesses, NRC relied on the utility to take corrective actions for other emergency preparedness problems and weaknesses. However, Consolidated Edison did not correct the weaknesses identified. For example, in 1998 and again in 1999, NRC identified problems with activating the pagers used to alert the utility's staff about an emergency as well as other communication weaknesses. In 1999, NRC concluded that Consolidated Edison lacked the ability to detect and correct problems and determine their causes, resulting in weak oversight of the emergency preparedness program. In response, NRC staff said that they met with utility managers to specifically discuss and express NRC's concerns with the emergency preparedness program. In commenting on a draft of this report, NRC noted that a

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September 1999 special inspection confirmed that Consolidated Edison's emergency preparedness program would provide reasonable assurance of protecting the public and that the utility could or would take adequate protective measures during an emergency.

Utilities' commitment to take timely corrective action and effective NRC oversight of the actions taken became even more important when, in April 2000, NRC implemented its new safety oversight process. (App. III provides a brief description of the new process for emergency preparedness.) This is because under the new safety oversight process, NRC will rely even more on utilities to track and correct certain problems through their corrective action programs. During subsequent inspections, NRC will select a sample of corrective actions taken to verify that they resolve the findings and limit the potential that they will recur. Therefore, without a strong commitment by the utility to follow through to fix problems or when NRC does not hold utilities accountable for fixing them, problems can worsen. This is what happened at Indian Point 2. As described in the next section, some of the problems that occurred during the February 2000 event were uncorrected from the past, which confirmed that Consolidated Edison did not effectively correct its many emergency preparedness weaknesses.

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**Consolidated Edison's  
Actions to Resolve  
Identified Weaknesses Are  
Incomplete**

NRC conducted an intensified inspection effort to determine the causes of and response to the February 2000 event. During the inspections, NRC identified several emergency preparedness problems. Although Consolidated Edison has taken actions to correct these problems, a recent NRC inspection found that similar problems persist.

Despite concluding that Consolidated Edison took the necessary steps to protect public health and safety during the February 2000 event, NRC identified several weaknesses with the emergency preparedness program at Indian Point 2. For example, Consolidated Edison did not activate its emergency operation facilities within the required 60 minutes primarily because of the complex process used to page the emergency response staff. As a result, the on-site response was delayed and the utility had no process to ensure that all emergency response staff were notified. In addition, NRC's Office of the Inspector General identified other emergency preparedness issues that are discussed in appendix IV along with NRC's

response to them.<sup>2</sup> The Office of the Inspector General concluded, and NRC agrees, that recurring uncorrected weaknesses at Indian Point 2 played a role in the utility's response during the February 2000 event. Table 1 briefly describes some of the weaknesses that occurred during the event and the actions that the utility has taken to resolve them.

**Table 1: Selected Emergency Preparedness Weaknesses That Occurred During the February 2000 Event and the Corrective Actions Taken by Consolidated Edison**

Emergency preparedness weakness	Corrective action taken
Consolidated Edison did not activate its emergency operation facilities within the required 60 minutes primarily because of the complex process used to page the emergency response staff.	Consolidated Edison revised its pager activation process and upgraded its pagers. It trained emergency response personnel and tested their ability to respond during 10 training drills and an unannounced call. It activates the pagers weekly to verify that they are functional.
Consolidated Edison did not keep track of emergency response personnel as they entered the plant site and could not account for them within the required 30 minutes—it took about 20 minutes to activate the pagers.	Consolidated Edison revised its accountability process, trained personnel in the new process, and tested their ability to respond during four unannounced drills.
Consolidated Edison failed to properly communicate information about whether a radiation release had occurred and its magnitude.	Consolidated Edison, the state, and counties revised the form used to report whether a release of radiation had occurred and its magnitude. In addition, the counties have agreed that they, rather than Consolidated Edison, will notify elected officials. To do so, Consolidated Edison paid for the counties to install a “reverse 911” system, which supplements an existing manual system. The “reverse 911” system dials the necessary telephone numbers and records whether the individual has received the message. The system is programmed to make three separate attempts to notify each relevant local official.
Consolidated Edison’s technical representatives were late to arrive at the counties’ emergency operations centers.	Consolidated Edison has assigned to the counties technical representatives who will respond immediately to an emergency. It is also working with the counties to install a videoconferencing system in the four emergency operations centers to enhance communications between the plant and off-site officials.
The emergency response data system (the real-time data link between the plant and NRC) was inoperable for the first several hours because of a preexisting equipment problem.	Consolidated Edison implemented surveillance testing and routine monitoring to help ensure that the system is operational.

<sup>2</sup>See NRC’s *Response to the February 15, 2000, Steam Generator Tube Rupture at Indian Point Unit 2 Power Plant* (Case No. 00-03S, Aug. 29, 2000).

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Emergency preparedness weakness	Corrective action taken
Problems arose in implementing the media response plan. For example, technical and support personnel lacked familiarity with their jobs, and an outdated telephone list prevented Consolidated Edison from contacting a local official.	Consolidated Edison established new procedures for the joint news center, trained relevant personnel, and purchased new computers to improve information availability. It has established a process to update telephone lists. In addition, the counties have agreed that they, rather than Consolidated Edison, will notify elected officials. To do so, Consolidated Edison paid for the counties to install a "reverse 911" system, which supplements an existing manual system. The "reverse 911" system dials the necessary telephone numbers and records whether the individual has received the message. The system is programmed to make three separate attempts to notify each relevant local official.
The technical support needed to resolve procedural and other plant technical issues was not timely and was of limited help.	Consolidated Edison has revised its procedures, added staff, and provided additional training for its staff. It conducted 11 training drills, including 5 that were unannounced, during calendar year 2000 to test the staff's knowledge about procedural and plant configuration issues.

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Consolidated Edison subsequently undertook an evaluation of its entire emergency preparedness program to determine the causes of the deficiencies and develop corrective actions. In its evaluation, Consolidated Edison concluded that senior management did not pay sufficient attention to the emergency preparedness program or problems at Indian Point 2 because such problems were not viewed as a high priority warranting close attention and improvement. As a result, emergency preparedness had relatively low visibility, minimal direction, and inadequate resources. The company also found that (1) the emergency response organization had been stagnant, understaffed, poorly equipped, and consistently ineffective; (2) the emergency manager performed collateral and competing duties; and (3) for a period of time, a contractor held the manager's position. Consolidated Edison also found that the professional development and continuing training of the emergency planning staff had been minimal. Consolidated Edison undertook various initiatives to address the deficiencies noted. The initiatives, including those identified in table 1, are described in its business plan for calendar years 2000 and 2001. Appendix V shows some of these initiatives.

Despite the various actions that Consolidated Edison took to correct its emergency preparedness problems, in April 2001, NRC reported that it had found problems similar to those previously identified at Indian Point 2. NRC again found communication and information dissemination weaknesses. It also found that the utility's training program had not prevented the recurrence of these issues during on-site drills and that its actions to resolve other weaknesses had not been fully effective. NRC said that Consolidated Edison had identified the major issues in its business



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plan, which, if properly implemented, should improve emergency preparedness at the plant. In commenting on a draft of this report, NRC noted that its April 2001 inspection report concluded that Consolidated Edison's emergency preparedness program would provide reasonable assurance of protecting the public.

Although Consolidated Edison has been making improvements in its emergency preparedness program, officials recognize that these actions alone will not enhance the public's confidence in its ability to effectively respond to a radiological emergency. The company must, for example, follow through on its commitments to help achieve public confidence and to have a strong emergency preparedness program. More importantly, Entergy, which expects to assume ownership of the plant later this year, will need to continue the corrective actions begun by Consolidated Edison.

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## The Four Counties Strengthened Their Emergency Preparedness Programs as a Result of the Lessons Learned From the February 2000 Event

The four counties that are responsible for responding to a radiological emergency at Indian Point 2 have strengthened their programs as a result of the lessons learned from the February 2000 event. The lessons learned included the need to improve (1) communications during an emergency, (2) how the media is provided with information, and (3) coordination among the counties in the way they respond to a radiological emergency.

The need to improve communications between Consolidated Edison and the counties about the extent of the emergency and the potential impact on the public was an important lesson learned from the event. This lesson resulted in one important change to improve communications among the state, counties, and Consolidated Edison—that is, revising the Radiological Emergency Data Form. The utility completes the form 15 minutes after declaring an emergency and updates it at 30-minute intervals thereafter. Although the February 2000 event posed no danger to the public, Consolidated Edison reported that a radioactive release had occurred but that it posed no danger to the public. County officials, on the other hand, reported that no release had occurred. This contradictory information led to credibility problems with the media and the public.

In April 2000, Consolidated Edison, in partnership with the state and counties, revised the form to ensure that all affected parties are “speaking with one voice” when providing the media and the public with information. Before the emergency, the counties did not have a defined process to determine the information they needed and how they would

present that information to the public. Figure 2 shows the relevant section of the form used during the February 2000 event and the revisions made to it.

**Figure 2: Comparison of the Relevant Section of the Radiological Emergency Data Form During and After the Event**

<i>As of February 2000</i>	<i>As of April 2000</i>
<p><i>Release of radioactive materials</i></p> <p>A. No release (above technical specification limits)</p> <p>B. Release to the atmosphere above technical specification limits</p> <p>C. Release to a body of water (above technical specification limits)</p>	<p><i>Release of radioactive materials</i></p> <p>A. No release</p> <p>B. Release below federally approved operating limits (technical specifications)</p> <p>[ ] To atmosphere [ ] To water</p> <p>C. Release above federally approved operating limits</p> <p>[ ] To atmosphere [ ] To water</p> <p>D. Unmonitored release requiring evaluation</p>

Source: New York State Emergency Management Office.

As can be seen from figure 2, the form now clearly shows whether a release has occurred.

- Some other actions that the counties have taken to improve their radiological emergency programs include the following:
- All four counties have agreed to activate their emergency operation centers at the alert level (a low-level event). Before the event, the counties differed on when they would activate their centers. Rockland County activated its center at the alert level; the other three counties activated their centers at the site-area emergency level (the next level above an alert). As a result, once Rockland activated its center during the February 2000 event, the media questioned why the other three counties had not done so. According to FEMA officials, Rockland County activated its center earlier than the other counties because it is the only county whose center is located within 10 miles of the plant.
- The counties will activate the Joint News Center (located at Westchester County airport) at the alert level. Before the February 2000 event, the counties individually decided when to activate the Joint News Center.

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- The “Executive Hot Line” that linked the state, four counties, and governor has been linked to the emergency operations facility at Indian Point 2 to establish and maintain real-time communications during an emergency.

Even before strengthening their programs, county officials believed—and continue to believe—they can protect public health and safety during a radiological emergency. They take this position because they have used as much as 80 percent of the plan for Indian Point to respond to such natural disasters as hurricanes, snow and ice storms, and Y2K.

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## Counties Suggest Better Communication Among NRC, FEMA, and Nonstate Entities With a Major Role in Radiological Emergency Preparedness

Beyond the actions already taken by Consolidated Edison and the counties to improve their emergency response programs, county officials suggested changes that would improve communications among NRC, FEMA, and nonstate entities. In particular, county officials said that since they are responsible for radiological emergency preparedness for Indian Point 2, NRC and FEMA should communicate directly with them during nonemergency situations. In New York and 16 other states—where more than half of the nation’s 103 operating nuclear power plants are located—counties or other local governments are responsible for radiological preparedness, but NRC and FEMA communicate primarily with the states and rely on the states to communicate with local jurisdictions. In response to the counties’ suggestion, NRC said that routinely meeting with local officials would be resource intensive, and FEMA said that some states limit it from routinely communicating with local officials. However, NRC has not assessed the costs and benefits of meeting with local officials, and the four New York counties have not been privy to information concerning various FEMA initiatives that will affect their emergency preparedness programs.

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Increasing Public  
Confidence May Be  
Difficult When NRC Does  
Not Routinely  
Communicate With Those  
Responsible for  
Responding to  
Radiological Emergencies

One of NRC's four performance goals, established to comply with the Government Performance and Results Act of 1993, is to increase public confidence in it as a regulator.<sup>3</sup> Yet, NRC routinely communicates with the states rather than other entities that are responsible for radiological emergency preparedness and response. FEMA's information shows that in 17 states where more than half of the 103 operating commercial nuclear power plants are located, other entities, such as counties or local governments, are responsible for radiological emergency preparedness and response. Not communicating with these other entities could threaten NRC's ability to achieve its public confidence goal.

At least every 5 years, NRC staff expect to meet with officials from all 31 states that have operating nuclear power plants. NRC also provides state officials with training on such issues as the agency's role and the resources it can provide in the event of a radiological emergency as well as the resources that other federal agencies can provide. According to NRC staff, they meet with some states more frequently, and the requests to meet exceed the agency's capability. As a result, NRC is examining ways to combine training and meetings on different subjects to maximize its outreach efforts and improve the manner in which it communicates with the states.

Although NRC's policy is to meet at the state level, its staff believe that local officials have various options for meeting with NRC. For example, local officials are not precluded from participating in the meetings held at least every 5 years with the states and can interact with NRC staff during public meetings, including those held annually for all plants. They also noted that NRC would likely meet with local officials if asked to do so. But emergency preparedness officials from the four counties around Indian Point 2 said they do not believe that public meetings are the appropriate forums for government-to-government interactions. Therefore, the counties suggested that NRC should meet with them at least annually.

NRC has also been considering other changes in its relationship with local officials that could improve routine communications about emergency preparedness. For example, earlier this year, NRC staff considered the following questions: What should the resident inspectors (inspectors

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<sup>3</sup>The four performance goals are to maintain safety, increase public confidence, make NRC's activities and decisions more effective and efficient, and reduce unnecessary regulatory burden on stakeholders.

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assigned to each nuclear plant) do differently in the future concerning interacting with local officials, and should the inspectors participate in public meetings to discuss a plant? NRC staff considered various options to resolve these issues. NRC has considered, for example, inviting local officials to meet privately with resident inspectors at the conclusion of the biennial exercise briefings or having resident inspectors attend the annual meetings that NRC holds with the public to discuss the results of the new safety oversight process for each plant. In an April 2001 memorandum, the staff said they would modify NRC's internal guidance to encourage using resident inspectors to increase communications with local officials. Resident inspectors generally live near the plants, are the most likely candidates to communicate with local officials, and should be the most knowledgeable about plant operations that could affect off-site officials. However, NRC also has staff in four regional offices around the country and at its headquarters in Rockville, Maryland, that could meet with local officials. NRC has not assessed the costs and benefits of using staff other than resident inspectors to meet with local officials.

In addition, in assessing the first year of the new safety oversight process's implementation, NRC expects to determine whether the annual plant meetings help the agency meet its public confidence goal. Since the public would be most concerned about how it could be affected by the plant in the event of an emergency, NRC's attaining this goal could be enhanced by interacting with those responsible for responding to radiological emergencies at nuclear power plants. According to NRC staff, routinely communicating with local officials has resource implications and meeting its public confidence performance goal entails a trade-off with the agency's other three goals—maintain safety, reduce unnecessary regulatory burden, and enhance the effectiveness and efficiency of its operations. However, NRC has not assessed the costs and benefits of meeting with local officials or the impact that such meetings would have on achieving its performance goals.

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### **FEMA Has Not Effectively Communicated With New York Counties Responsible for Responding to Radiological Emergencies at Indian Point 2**

FEMA generally implements its programs through the states and relies on the states to communicate relevant information to local jurisdictions. County officials responsible for emergency preparedness at Indian Point 2 identified examples where this method of communicating with local jurisdictions has not been effective.

For example, both New York State and county officials told us that the February 2000 event identified the need for flexibility in FEMA's off-site exercises. According to county officials, they responded to the event as

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they would have responded during FEMA's exercises, which are conducted to the general emergency level. Yet, they noted, the response for an alert like the one that occurred at Indian Point 2 is significantly different from the response that would be taken during a general emergency when a significant amount of radiation would be released off the plant site, and the counties would monitor the magnitude of the release and calculate the dose that the public would receive. As a result, state and county officials suggested that it would be more realistic to periodically conduct biennial exercises at the alert level, which they noted, and NRC's data confirm, occur more frequently than a general emergency, which has never occurred in this country. At the alert level, the counties would activate their emergency operations centers and take other response actions as they did during the February 2000 event. In commenting on a draft of this report, FEMA said that the emergency plans for the four New York counties require them to conduct off-site monitoring and dose calculations at the alert level.

According to FEMA officials, because the exercises at Indian Point 2 were conducted at the general emergency level, the counties were able to respond appropriately to the February 2000 event. They also noted that FEMA's regulations allow state and local jurisdictions the flexibility to structure the exercise scenarios to spend more time at the alert level and less time at the general emergency level. Nevertheless, county officials who participate in the exercises were not aware of the flexibility allowed by FEMA's regulations. One reason for their lack of knowledge is that county officials with whom we met did not participate in developing the exercise scenarios. In commenting on a draft of this report, FEMA said that it would consider the counties' suggestions when finalizing its new streamlined exercise process.

In another example, county officials suggested that FEMA should consider using tabletop exercises to supplement the biennial exercises.<sup>4</sup> Since 1999, FEMA has been considering a proposal that would allow state and local jurisdictions to use alternative techniques, including tabletop exercises, for one of the three exercises conducted over a 6-year period. (App. VII briefly describes FEMA's initiatives and their status.) FEMA expects to revise its regulations in calendar year 2003 to allow the alternative

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<sup>4</sup>A tabletop exercise is a structured discussion, which is based on a scenario or set of conditions for potential emergency response situations, among decisionmakers or responders in a low-stress environment. Tabletops are intended to be a teaching, training, and developmental aid.

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techniques. Yet, county officials with whom we met were not aware that FEMA was considering a regulatory change or how it would affect their emergency preparedness programs. Communicating such information to the counties would be invaluable, since a NRC document on conducting tabletop exercises for radiological emergency response notes that it can take as long as 6 months to plan the exercise and up to 6 months to report on the lessons learned and the corrective actions for the issues identified.

Finally, although county officials knew that FEMA expected to implement a streamlined exercise process in October 2001, they were not aware of the particulars of the process or how it would affect their actions during the exercises. According to a New York State official, the state participated in developing the streamlined process and briefed the counties about it. In commenting on a draft of this report, FEMA said that one Westchester County official received information related to the new streamlined exercise process; it had posted information on its Web page; and it provided state, tribal, and local governments with information at an annual conference. Despite these actions, as late as April 2001, county officials responsible for emergency preparedness at Indian Point 2 told us that they had received no information on the particulars of the streamlined exercise process. Good business practices would seem to indicate that FEMA would ensure that local jurisdictions are privy to information that will affect their responses during the exercises and ultimately to a radiological emergency.

We do not know whether the communication issues experienced by the four New York counties are typical of the experience of the other locations where the responsibility for radiological emergency preparedness rests with an entity other than the state. Nevertheless, the impact that a radiological emergency—even one like an alert that does not endanger the public—can have on communities around nuclear power plants would seem to highlight the need for effective communication to prepare for and respond to such emergencies.

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## Conclusions

A more proactive approach by Consolidated Edison to fix recurring weaknesses that had been identified over several years could have improved the implementation of its emergency preparedness plan during the February 2000 event. NRC's vigilance is needed to ensure that Consolidated Edison and the new owner, Entergy, complete the planned improvements. This event also demonstrated the importance of effective, clear communication networks, both on-site in regard to the need to ensure that pagers work well to notify key personnel of an emergency, as

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well as off-site, in regard to communicating about the extent and magnitude of the emergency. The ultimate measure of Consolidated Edison's, the state's, and counties' readiness in a radiological emergency is the manner in which they respond to an actual event. Exercises, while playing a valuable role in preparing for and assessing such readiness, more than likely will not identify the human reactions and all communications issues that could arise in a real radiological emergency. This was demonstrated during the February 2000 event.

In addition, the way the February 2000 event played out underlines the critical importance of following through with lessons learned for Consolidated Edison, the state, and counties and determining whether some of these lessons could be applied to other plants. In this regard, NRC's and FEMA's interacting primarily with the states for routine communications needs to be reassessed at least for the 17 states where another entity is responsible for radiological emergency responses. The four Indian Point counties' lack of knowledge regarding the flexibility in FEMA's regulations to spend more time at various emergency levels and its proposed streamlined exercise process demonstrate that FEMA's reliance on the state to communicate with the local communities did not work in this case. Now may be an opportune time for NRC and FEMA to assess the extent to which they communicate with those responsible for effecting radiological emergency response.

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## Recommendations for Executive Action

Since the responsibility for responding to radiological emergencies at a large percentage of this nation's nuclear power plants rests with an entity other than the state, we recommend that the Commissioners direct NRC staff to assess the agency's position of generally communicating with state officials during nonemergency situations.

To improve communications with local governments, we recommend that the Director of FEMA determine the reasons why the four counties responsible for emergency response at Indian Point 2 are not knowledgeable about FEMA's initiatives and, if necessary, reassess its current practice of communicating through the state during nonemergency situations.



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## Agency Comments and Our Evaluation

We provided NRC and FEMA with a draft of this report for their review and comment. NRC's comments are in appendix VIII; FEMA's comments are in appendix IX. NRC neither agreed nor disagreed with our recommendation. However, NRC reiterated its position that communicating with about 160 counties during nonemergency times would be resource intensive. NRC also raised three issues. First, NRC said that we should make it clear our recommendation relates to nonemergency communications. We have done so. Second, NRC noted that it maintained a very strong regulatory posture at Indian Point 2 in the emergency preparedness area and that its actions were commensurate with the safety significance of the emergency preparedness problems at the plant. Since we had not inferred otherwise, we did not revise the report. Third, NRC noted that despite the problems at the plant, Consolidated Edison's emergency preparedness program would protect the public in the event of a radiological emergency. We added this information to the report, where appropriate. Although FEMA expressed the view that it would be inappropriate to deal exclusively with the counties (something we did not recommend), it plans to increase its interaction with local officials nationwide in the coming years.

NRC and FEMA provided technical clarifications, which we incorporated as appropriate.

We conducted our work from November 2000 through July 2001 in accordance with generally accepted government auditing standards. Appendix X provides details on our scope and methodology.

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Unless you publicly announce its contents earlier, we plan no further distribution of this report until 10 days after the date of this letter. At that time, we will send copies to the Chairman, Nuclear Regulatory Commission; the Commissioners, Nuclear Regulatory Commission; the Director, Federal Emergency Management Agency; and the Director, Office of Management and Budget. We will make copies available to others on request.

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If you or your staff have any questions about this report, please call me on (202) 512-3841. Key contributors to this report were Mary Ann Kruslicky, Philip Olson, and Carrie Stevens.

A handwritten signature in black ink that reads "Gary L. Jones". The signature is written in a cursive style with a large, stylized "G" and "J".

(Ms.) Gary L. Jones  
Director, Natural Resources and Environment

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*List of Congressional Requesters*

The Honorable Dan Burton  
Chairman, Committee on Government Reform  
House of Representatives

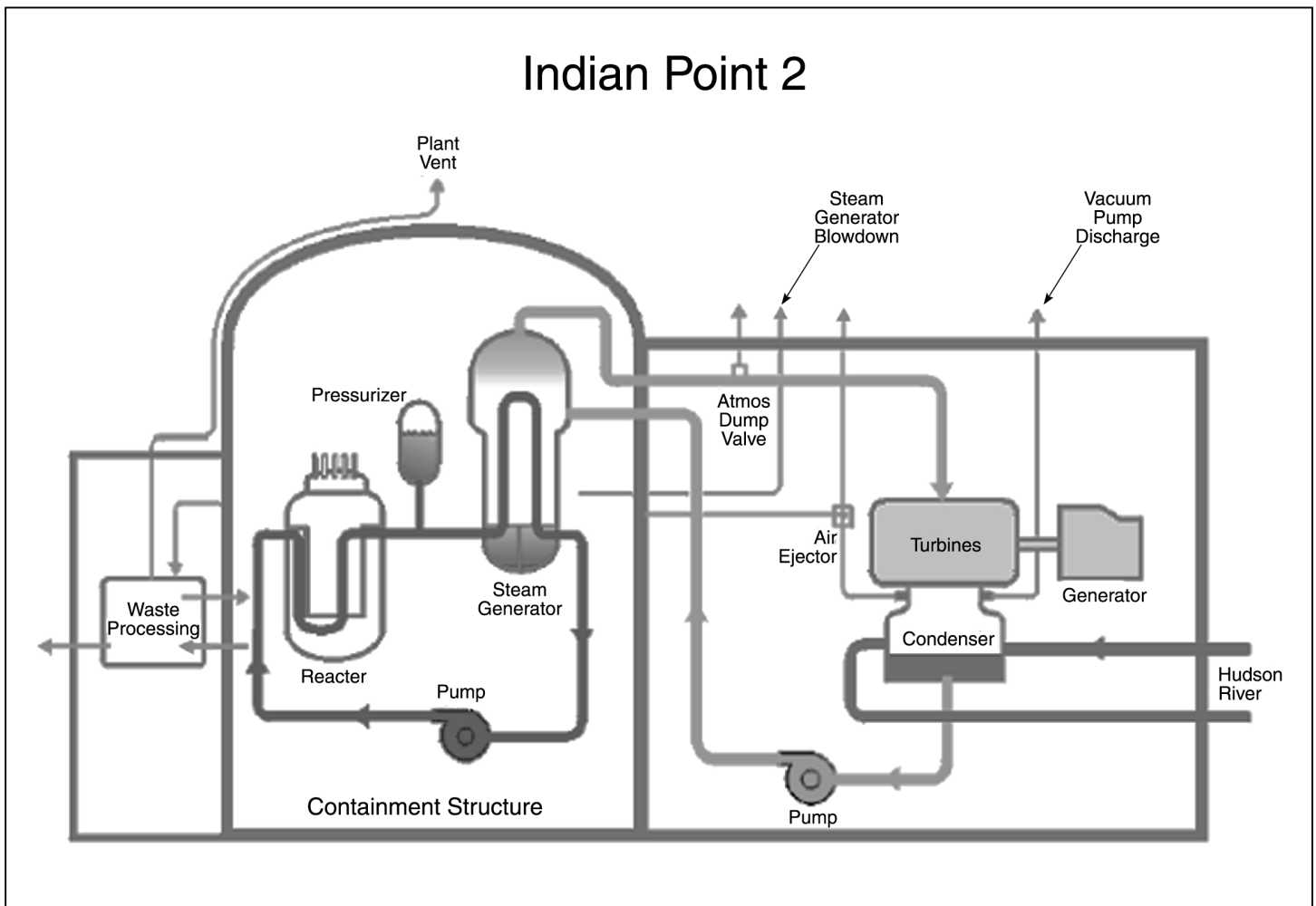
The Honorable Benjamin A. Gilman  
House of Representatives

The Honorable Sue Kelly  
House of Representatives

The Honorable Nita M. Lowey  
House of Representatives

# Appendix I: Indian Point 2 Steam Generator

**Figure 3: Indian Point 2 Steam Generator in Relation to Other Plant Equipment and the Locations Where a Leak Could Release Radioactive Material to the Environment**



Source: Nuclear Regulatory Commission.

# Appendix II: The Nuclear Regulatory Commission's Emergency Action Levels and Conditions That Could Cause an Emergency

**Table 2: The Nuclear Regulatory Commission's Emergency Action Levels and Some Examples of Nuclear Power Plant Conditions That Could Cause an Emergency**

Emergency action level and definition	Examples
<b>Unusual event</b> An extremely low-level emergency that poses no threat to public safety but warrants increased awareness on the part of utility and off-site personnel.	Reactor coolant samples indicate measurable damage to the metal tubes that hold the uranium fuel pellets. The water level in the spent fuel pool is low. Water leaks from the reactor coolant system in excess of The Nuclear Regulatory Commission's allowed limits. The main turbine is severely damaged. Loss of all on- and off-site communication equipment occurs.
<b>Alert</b> A low-level emergency that poses no threat to public safety but for which precautionary mobilization of certain emergency response functions is appropriate. Any radioactive release is expected to be limited.	High radiation readings occur inside the primary containment—a large concrete and steel structure that surrounds the reactor vessel and its coolant system. Water leaks from the reactor coolant system at a rate greater than 50 gallons per minute. Radiation levels in one or more vital areas (equipment necessary for the safe operation and shutdown of the plant) are high. Damage to the main turbine results in damage to vital equipment. Unauthorized personnel enter the protected area (area that includes vital plant structures and is surrounded by a security fence). A fire occurs that could potentially affect safety systems and an explosion occurs that damages permanent plant equipment. A toxic or flammable gas is released in or near a vital area.
<b>Site-area emergency</b> Plant conditions degrade to a point where full activation of response functions is warranted. Any radioactive release is not expected to exceed the Environmental Protection Agency's exposure levels, except near the site's boundary.	The normal methods of cooling the reactor—feed water system, main steam system, or steam generators—do not function. All alternating current electrical power to vital busses (on-site network to supply electric power) is lost for more than 15 minutes. Unauthorized personnel enter a vital area of the plant.
<b>General emergency</b> Actual or imminent substantial degradation or melting of the reactor with the potential for a significant radioactive release to the environment beyond the plant's boundary occurs.	Two of the three fission product barriers (fuel cladding, reactor coolant system, and containment) fail. All alternating current electrical power (on- and off-site) is lost and not expected to be available for an extended period of time. Unauthorized personnel take over the control room so that the utility loses the ability to safely operate or shut down the plant.

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# Appendix III: Description of NRC's New Safety Oversight Process for Emergency Preparedness

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In April 2000, the Nuclear Regulatory Commission (NRC) implemented its new safety oversight process for nuclear power plants. Emergency preparedness is one of seven “cornerstones” of the new safety oversight process.<sup>1</sup> The cornerstones represent the activities that are essential for the safe operation of the plants. The new safety oversight process also includes performance indicators, inspections, and an assessment of the safety significance of the inspection findings for all seven cornerstones. NRC integrates the indicator results with inspection findings to arrive at a conclusion about the overall safety performance of the plants and the regulatory response that should be taken, if any.

Under its new safety oversight process, NRC has stratified emergency preparedness requirements on the basis of their safety significance. The focus of inspections is the 16 standards in 10 C.F.R. 50.47(b). NRC concluded that the standards are not equally important to safety. As a result, NRC identified the following four planning standards that are the most significant from a safety standpoint:

- Timely and accurate classification of events because untimely and inaccurate classification can delay the activation of the utility's emergency response organization and notification of off-site governmental authorities.
- Timely and accurate notification of off-site governmental authorities.
- Timely and accurate development of recommended actions that off-site authorities should take to protect the public.
- Assessment of the off-site consequences of a radiological emergency condition.

NRC focuses its oversight and inspection resources in emergency preparedness on these four standards. NRC's procedures set out the agency's expectations for inspectors and the methodology to be used to prioritize and expend resources for the remaining 12 standards. In addition, each year, NRC expects its staff to verify the accuracy of performance indicator data, the utilities' problem identification and resolution programs, and the tests of the emergency response organization and public alert and notification system (sirens).

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<sup>1</sup>The seven cornerstones are *initiating events, mitigating systems, barrier integrity, emergency preparedness, public radiation safety, occupational radiation safety, and physical protection*.

As part of the new safety oversight process, NRC identified three performance indicators for emergency preparedness: drill/exercise performance, emergency response organization drill participation, and reliability of the alert and notification system. The drill/exercise indicator measures performance in specific risk-significant activities; the emergency response organization indicator provides information to assess the licensees' development and maintenance of key skills. From these two indicators, NRC can assess the quality of training and emergency-plan-implementing procedures as well as facility and equipment readiness, including communications; personnel performance; and organizational and management changes. In addition, a high rate of reliability of the alert and notification system increases assurances that the utility can protect public health and safety during an emergency. Table 3 shows performance indicator data for Indian Point 2 from April 2000, when NRC instituted the new safety oversight process, through March 2001, the month of the most currently available data.

**Table 3: Performance Indicator Data Through March 2001**

Shown as a percentage			
Performance indicator	April 2000	December 2000	March 2001
Drill/exercise performance	91.2	94.5	95.2
Emergency response organization drill participation	100.0	98.4	100.0
Reliability of the alert and notification system	99.1	99.0	98.9

Source: NRC.

For each indicator, NRC has established thresholds for increased agency oversight of commercial nuclear plants. For example, if the utility's drill/exercise performance is less than 90 percent, if the emergency response organization drill participation is less than 80 percent, or if the reliability of the alert and notification system is less than 94 percent, NRC will focus greater attention on emergency preparedness activities at a plant. As shown in table 3, since the inception of these performance indicators in April 2000, Indian Point 2 has always exceeded NRC's thresholds.

In commenting on a draft of this report, NRC noted that it selected the three performance indicators in conjunction with stakeholders because they represented objective measures to monitor safety-significant emergency preparedness activities. According to a representative of the Union of Concerned Scientists, two of the performance indicators—

drill/exercise performance and emergency response organization drill participation—are appropriate, but the alert and notification system indicator is not. The reason is that the indicator reflects only the results of monthly tests done on the alert and notification system and how many pass or fail. However, if the equipment is inoperable between the time that the tests are conducted, this is not reflected in the indicator. Yet, inoperable equipment and equipment failure do happen. The Union's representative believes a better indicator would be "availability"; that is, the total hours in a month that the equipment does not operate and for how many hours it is inoperable. NRC staff expect to assess the first-year implementation of the new safety oversight process and recommend changes to the Commission. In commenting on a draft of this report, NRC noted that although an availability indicator could enhance the current performance indicators, it selected the reliability indicator to be consistent with the Federal Emergency Management Agency's guidance for siren testing and reporting.



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# Appendix IV: Some Emergency Preparedness Issues Identified by NRC's Office of the Inspector General

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In August 2000, NRC's Office of the Inspector General reported on emergency preparedness and other issues at Indian Point 2. Selected issues and the affected parties' plans to address them are discussed below.

- Local officials want increased interaction with NRC on a routine basis. As of April 3, 2001, NRC had determined that it would modify its inspection guidance to encourage using resident inspectors for increased communications to enhance local public confidence in NRC.
- Communication between county emergency operations centers and NRC was nonexistent during the emergency. NRC does not expect to take any action on this issue because the agency does not normally communicate with local centers but, rather, relies on the state as a single point of contact. The state is responsible for providing the counties with information as well as evaluating the emergency and the appropriate response to it.
- NRC did not notify the U.S. Secret Service about the emergency. NRC transmitted information about the emergency to the White House Situation Room, which was responsible for informing the Secret Service. However, because of the proximity of former President and Senator Clinton's residence to the plant (11-1/2 miles), NRC and the Secret Service finalized a new protocol, whereby NRC will notify the Secret Service whenever a problem occurs at any NRC-licensed facility, including commercial nuclear power plants.
- The release of information was not timely. According to NRC staff, in a December 2000 letter, Consolidated Edison provided information that refuted the Inspector General's findings and concluded that information was released in a timely manner.
- The state experienced difficulties in getting information about the emergency from Consolidated Edison. The utility expects to stress the importance of communications with off-site agencies in its training program. NRC will monitor the actions taken.
- English is a second language for many who live within 10 miles of the plant. According to NRC staff, FEMA is responsible for evaluating this issue. FEMA officials said they will evaluate this issue after the final 2000 Census data are available. They noted, however, that they expect the 2000 Census data to show that Spanish is a second language for more than 5 percent of the population within 10 miles of Indian Point and that the various oriental language groups are likely to approach and may exceed 5 percent. According to FEMA officials, this could be a significant issue for Indian Point, which has an estimated 280,000 people within 10 miles of the site. FEMA expects to complete a draft report on this issue by the end of calendar year 2001.

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# Appendix V: Emergency Preparedness

## Corrective Actions Initiated by Consolidated Edison Since the February 2000 Event

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- Establish a minimum of three emergency response organization teams.
- Implement an improved emergency drill and exercise program.
- Implement an improved emergency facility and equipment check surveillance program.
- Implement an improved self-assessment and performance indicator process.
- Implement an improved training program for emergency management staff.
- Revise the process for staffing the emergency notification telephone system in the technical support center.
- Develop surveillance tests for the emergency response data system.
- Establish an emergency off-site technical advisor program.
- Upgrade the Meteorological Information Data Acquisition System.
- Upgrade the off-site Reuter-Stokes radiation monitoring system.
- Upgrade the siren verification system.
- Revise and implement an off-site monitor training program.
- Develop and implement a Web page for Indian Point 2.
- Issue new pagers to plant personnel.
- Conduct off-hours drills.
- Train joint news center personnel.
- Train company personnel who communicate with the media.
- Develop communication and visual aids to better provide the public with information.

# Appendix VI: County Officials' Suggestions to Improve Radiological Emergency Preparedness and NRC's/FEMA's Responses

**Table 4: Suggestions Made by County Officials to Improve Radiological Emergency Preparedness and NRC's and FEMA's Responses**

Suggested action	NRC staff's response	FEMA's response
<b>NRC and FEMA</b>		
NRC and FEMA need to condition off-site jurisdictions that an alert does not equate to a general emergency.	Any outreach effort is beneficial and would help NRC meet its "increase public confidence" performance goal. However, NRC does not normally communicate with local jurisdictions but, rather, relies on the state as a single point of contact. NRC believes that its state outreach efforts have been successful. In addition, it would be very resource-intensive if NRC were to routinely meet with local officials.	FEMA's guidance allows states and local jurisdictions the flexibility to structure the exercise scenarios to spend more time at the alert level and less time at the general emergency level.
<b>FEMA only</b>		
FEMA should not always conduct exercises at the general emergency level. In other words, FEMA should vary the emergency action level during its exercises.	NRC's Region I staff said that conducting exercises at the general emergency level contributed to the positive responses taken by local jurisdictions during the February 2000 event. However, the probability that a general emergency will occur is very small while the probability for an alert is greater.	FEMA's guidance allows states and local jurisdictions the flexibility to structure the exercise scenarios to spend more time at the alert level and less time at the general emergency level.
FEMA should establish liaisons with the counties that would be familiar with the relevant emergency plan. The liaisons would participate in the off-site exercises.		With only one exception, FEMA implements its programs through the states. The states are responsible for assisting local jurisdictions and providing them with information. New York State officials have asked FEMA to coordinate its communications/interactions with local jurisdictions through the state.  FEMA has assigned five staff involved with emergency preparedness at Indian Point. FEMA has a site manager (at all nuclear plant sites) and a team leader for each New York county within 10 miles of the plant. Although the site manager and team leaders are not located at the plant, they are familiar with the local emergency plans and participate in the exercises.
FEMA could conduct tabletop exercises in lieu of the off-site exercises on a rotating basis.	One of the initiatives resulting from FEMA's strategic review would allow state and local jurisdictions to use alternative techniques in one of the three exercises conducted over a 6-year period. NRC is developing a rule-making plan to revise its emergency preparedness regulations, and staff expect to provide the Commission with their recommendations by the end of calendar year 2001. NRC will coordinate the content and timing of its rulemaking with FEMA.	Tabletop exercises have limited usefulness in the radiological emergency preparedness program. Tabletop exercises could be used to test the decisions made by off-site officials but would not be beneficial for testing the participants' ability to appropriately measure radiation releases and calculate the dose received.  FEMA's regulations allow states and local jurisdictions the flexibility to structure the exercise scenarios to spend more time at

**Appendix VI: County Officials' Suggestions to  
Improve Radiological Emergency  
Preparedness and NRC's/FEMA's Responses**

Suggested action	NRC staff's response	FEMA's response
		the alert level and less time at the general emergency level.
		One of the initiatives resulting from FEMA's strategic review would allow states and local jurisdictions to use alternative techniques in one of the three exercises conducted over a 6-year period. FEMA will revise its emergency preparedness regulations to implement this initiative. FEMA expects to finalize its regulations in calendar year 2003.
FEMA could use tabletop exercises to assess the state's and counties' ability to respond within the 50-mile ingestion pathway.	NRC staff said that nothing in FEMA's regulations would preclude states and local jurisdictions from conducting more exercises.	Although FEMA uses tabletop exercises to test other emergency responses, it has not used them for assessing radiological emergency responses within the 10-mile emergency planning zone at Indian Point 2. FEMA would have no objections to states and local jurisdictions using tabletop exercises to supplement the required 6-year exercises. In commenting on a draft of this report, FEMA noted that it has used tabletop exercises for the 50-mile ingestion pathway exercises.
FEMA should be at the counties' emergency operations centers during an alert. This would allow a real-time evaluation of performance and could eliminate the need for a biennial exercise.		Some alerts are short lived. It would be inappropriate for FEMA to establish an expectation that staff would be at emergency operations centers during an alert and then not meet that expectation.  FEMA's regulations set out policies and procedures for state and local jurisdictions to obtain credits for their response to an actual emergency or natural disaster. FEMA could not, however, give credit for radiation monitoring and dose assessments. So, an exercise of some aspects of the radiological emergency plan would need to be conducted.

**Appendix VI: County Officials' Suggestions to Improve Radiological Emergency Preparedness and NRC's/FEMA's Responses**

<b>Suggested action</b>	<b>NRC staff's response</b>	<b>FEMA's response</b>
FEMA should conduct unannounced exercises.	NRC staff did not believe it was viable or practical for FEMA to conduct unannounced exercises. They noted that a full-participation exercise can involve hundreds of participants, including volunteers, and that a large part of the training benefits of the exercise would be lost if FEMA did not announce them. They also noted that although FEMA, state and local jurisdictions, and the utility develop the exercise scenario, FEMA does not give the scenario to participants nor is the exact time of the exercise announced. Rather, FEMA announces the week in which the exercise will occur. Therefore, the exercise is "unannounced" since the state and local jurisdictions do not know the exact date on which it will occur.	FEMA conducts unannounced exercises for some aspects of radiological emergency preparedness. For example, in October 1999, FEMA conducted an unannounced and off-hours drill of the four Indian Point counties' ability to activate their emergency operations centers, mobilize their staff, and establish communication links with the plant.  As part of its efforts to streamline its program, FEMA is considering a proposal to eliminate unannounced exercises because of opposition from off-site officials throughout the country. In commenting on a draft of this report, FEMA said that it will continue to conduct unannounced drills for a specific situation—a fast-breaking emergency.
<b>NRC only</b>		
NRC should meet with officials from the four Indian Point 2 counties at least annually (i.e., during nonemergency times).	NRC does not normally interact with local officials but, rather, relies on the state as a single point of contact during emergencies and at other times. It would be very resource-intensive to meet with all local jurisdictions. However, NRC staff have assessed this issue and developed options to resolve it. Whatever option is selected must be applied consistently to all plants but must allow for regional and headquarters management flexibility in implementing the option because different plants may need to be treated differently, depending on the level of public interest about the plant.	FEMA officials said that they would have no objection to NRC's meeting with county officials.  In addition, if the Indian Point counties have issues or concerns about receiving information, FEMA's regional office could obtain the information for them or provide a bridge to other federal agencies.
<b>Other</b>		
Consolidated Edison or NRC needs to provide more public education on the actual and fictional hazards of nuclear power.	Although NRC and the licensee are responsible for educating the public, the licensee is primarily responsible for doing so. However, NRC's Web site provides some educational material and its Office of Public Affairs periodically conducts a workshop for the media. In addition, NRC's technical staff visit schools to discuss NRC's role and functions and how plants are designed.	Some states have active public education programs.  NRC could conduct education programs without violating the restriction that prohibits it from promoting nuclear power. A significant difference exists between conducting education programs and being an industry proponent.

# Appendix VII: Initiatives to Streamline FEMA’s Radiological Emergency Preparedness Program and Their Status

In June 1996, FEMA announced that it would review its radiological emergency preparedness program to identify opportunities to improve, streamline, and enhance its efficiency and effectiveness. The resulting 1999 report included 34 initiatives to improve the program. One group of initiatives is intended to streamline the radiological emergency preparedness program. Since that time, FEMA has completed 24 initiatives. FEMA expects to implement a streamlined exercise process in October 2001.

Some FEMA officials have raised concerns about the streamlined process. In particular, they are concerned with the (1) expanded use of granting credits for the responses taken for nonradiological emergencies, (2) increased use of out-of-sequence exercises (conducted separately from the biennial exercise) for some radiological preparedness activities and functions, and (3) possibility of eliminating unannounced exercises. We did not examine the validity of these concerns because they were outside the scope of this report. In commenting on a draft of this report, FEMA noted that it would monitor the implementation of the initiatives and will, if necessary, revise any that are not attaining the desired result. Table 5 shows the initiatives and their implementation status, according to FEMA officials.

**Table 5: FEMA’s Initiatives and Their Status**

Initiative	Implementation status
<b>Streamline the program</b>	
Consolidate evaluation objectives into six areas to support a results-oriented process	Interim evaluation areas published; four pilot exercises completed. On June 11, 2001, FEMA published the results of the pilot projects in the <i>Federal Register</i> , which included the new evaluation areas, for comment. FEMA expects to implement the new evaluation areas for the exercises conducted after September 30, 2001.
Conduct medical services drills biennially	Completed; policy took effect in October 1999.
Use out-of-sequence demonstrations of evaluation areas	Completed; policy took effect in October 1999.
Provide feedback at the conclusion of an exercise	Completed; policy took effect in October 1999.
Take immediate corrective actions during out-of-sequence demonstrations	Completed; policy took effect in March 2000.
Provide credit for unannounced and off-hours exercises and drills on the basis of the response to an actual emergency	Policy paper issued in September 2000 for comment.
Implement new exercise scenario options	Draft policy issued in October 2000. Policy will be finalized after FEMA revises its regulation.
Revise the annual letter of certification-related regulations	Complete but not as recommended. FEMA will not revise its regulations. Instead, it directed regional offices to ensure submission, consistency, and completeness of the letters.
Revise the annual letter of certification submittal requirements	Completed in July 2000.

**Appendix VII: Initiatives to Streamline  
FEMA's Radiological Emergency  
Preparedness Program and Their Status**

<b>Initiative</b>	<b>Implementation status</b>
Verify the documentation provided with the annual letter of certification	Completed in July 2000.
Negotiate agreements to conduct only two exercises over a 6-year period; revise regulations (FEMA and NRC) to allow for this change	Rulemaking in process. Implementing policy posted for public comment. FEMA expects to finalize its regulation late in calendar year 2003.
Conduct staff visits to assist states, tribal nations, and local governments	Completed; policy took effect in August 2000.
Develop a radiological emergency preparedness program manual that reflects revised and updated policies and guidance	FEMA expects to complete this initiative by October 1, 2001.
Revise the joint NRC/FEMA criteria and memorandum of understanding	Criteria will not be revised. Rather, an addendum updating the outdated references was provided to the agencies that are members of the Federal Radiological Preparedness Coordinating Committee for comment. In addition, in May 2001, FEMA and NRC published the addendum in the <i>Federal Register</i> for comment. The comment period ends on August 1, 2001.
Review all program guidance at least once every 2 years	Ongoing.
Post program guidance on FEMA's Web site	Completed; documents are placed on the Web site as they become available.
<b>Increase federal participation in exercises</b>	
Have FEMA take the lead in planning and coordinating exercises	Completed in September 2000.
Complete the Radiological Incident Annex	The information will be published as a revision to the Federal Response Plan.
Establish an interagency task force to review the charters of various response committees	Completed but not as recommended. FEMA recommended that the Federal Radiological Protection Coordinating Committee consider establishing the task force.
Identify additional resources needed	Completed.
Reinforce the role of the Federal Radiological Preparedness Coordinating Committee	Completed.
Review and revise training courses	Completed.
Establish a position in FEMA to facilitate communication	Completed.
<b>Use state, local, and tribal personnel as exercise evaluators</b>	
Establish conditions to use state, tribal, and local personnel as exercise evaluators	Completed.
Develop a memorandum of understand with state, tribal, and local governments that agree to provide exercise evaluators	Completed in June 2001.
Develop qualification standards for the nonfederal evaluators	Completed in June 2001.
<b>Include Native American tribal nations in the radiological emergency preparedness process</b>	
Identify areas for federal and tribal relationships	Completed.
Identify all federally recognized tribes in the 10- and 50-mile radius of nuclear plant sites	Completed.
Identify current government-to-government policies and practices	Completed.
Develop an approach to increase tribal involvement	Completed.
<b>Enhance training requirements and curriculum</b>	
Establish qualification standards for federal exercise evaluators	Completed.
Increase opportunities for FEMA staff to teach evaluator training	Completed.

**Appendix VII: Initiatives to Streamline  
FEMA's Radiological Emergency  
Preparedness Program and Their Status**

<b>Initiative</b>	<b>Implementation status</b>
Revise radiological courses	Short refresher course used during the pilot program at four nuclear plants. FEMA is developing a resident evaluator course using the new evaluation areas.
Develop an administration course for all FEMA radiological emergency preparedness staff	On hold, pending completion of the radiological emergency preparedness manual.

As can be seen from table 5, FEMA's major initiative related to streamlining its radiological emergency preparedness program. FEMA had more than 15 separate activities to attain this objective. For example, FEMA is proposing to move from an objective-based, checklist format, exercise evaluation, which is very structured and leaves little latitude to satisfy the exercise objectives by alternative means, to a more comprehensive/holistic approach. To this end, FEMA examined the 33 exercise objectives that it had developed to clarify what constituted an exercise and to ensure consistency in the method used to evaluate the exercises. FEMA consolidated the 33 objectives into six evaluation areas to support a results-oriented process. A results-oriented process will allow participants to complete an exercise activity without following a specific checklist and with more latitude to reach the desired results. This would allow FEMA to concentrate on the exercise results—not the methods used to reach the results—and would allow states or local jurisdictions to use an alternative method(s) to attain a result.

FEMA pilot tested the new exercise evaluation areas from October through December 2000 at four nuclear plant sites. The sites included Susquehanna 1 and 2 in Pennsylvania, Crystal River in Florida, Point Beach 1 and 2 in Wisconsin, and Duane Arnold in Iowa. Overall, the exercise participants at all four pilot projects were very positive about the new evaluation process. Likewise, feedback from FEMA's evaluators was mostly positive, but the evaluators identified three issues that FEMA needed to address. First, training needs to focus on how the evaluators must prepare for an exercise and become very familiar with the plans and facilities for which they are responsible. Second, FEMA needs to document the required components of off-site radiological emergency response plans, since the joint NRC/FEMA criteria leave room for interpretation in many planning areas. Finally, FEMA should establish a mentor program for new staff to help them achieve an acceptable evaluation capability. In June 2001, FEMA published its report on all four pilot projects in the *Federal Register* and allowed the public 60 days to comment. On the basis of the lessons learned from the pilot projects and public comments on them, FEMA expects to revise its proposed streamlined approach, if necessary, and implement it in October 2001.



# Appendix VIII: Comments From the Nuclear Regulatory Commission

Note: GAO's comments supplementing those in the report's text appear at the end of this appendix.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

July 13, 2001

Ms. Gary L. Jones, Director  
Natural Resources and Environment  
United States General Accounting Office  
Washington, DC 20548

Dear Ms. Jones:

I am responding to your request dated June 25, 2001, to review and comment on the U.S. General Accounting Office (GAO) draft report entitled, "Nuclear Regulation: Progress Made in Emergency Preparedness at Indian Point 2, but Additional Improvements Needed" (GAO-01-605), dated June 2001. We have three major comments concerning the report that I believe should be addressed. In addition, we have identified several minor issues, corrections and suggestions for the GAO to consider before finalizing the report.

Our comments and suggestions on the draft report are enclosed. If you have any questions, please contact Mr. Samuel J. Collins, Director, Office of Nuclear Reactor Regulation, at (301) 415-1270.

Sincerely,

A handwritten signature in black ink, appearing to read "William D. Travers".

William D. Travers  
Executive Director  
for Operations

Enclosure: U.S. NRC Comments

**U.S. NUCLEAR REGULATORY COMMISSION COMMENTS ON  
THE U.S. GENERAL ACCOUNTING OFFICE DRAFT REPORT ON  
NUCLEAR REGULATION: PROGRESS MADE IN EMERGENCY PREPAREDNESS  
AT INDIAN POINT 2, BUT ADDITIONAL IMPROVEMENTS NEEDED (GAO REPORT 01-605)**

**A. MAJOR COMMENTS**

1. The report discusses NRC communications in several places, i.e. pages 3, 4, 14, and 28, but does not differentiate between routine communications, and communications during responses to an event. This is an important distinction. Communications that take place during an event are well defined in Emergency Response Plans (ERPs), and coordinated with local, state, and federal agencies. Non-emergency communications are intended to help coordinate the responses of local, state, and federal agencies.

Non-emergency communications occur through either the conduct of emergency preparedness exercises, or routine meetings. Through the exercises, the Federal Emergency Management Agency (FEMA) evaluates the off-site performance of the local and state governments, and provides feedback on how well prepared these agencies are. NRC will fully participate, meaning Headquarters and regional participation, in four of these exercises a year, will participate with our regional staff in roughly six more exercises a year, and will, if states agree, participate in the ingestion exercise for as many plants as possible. The ingestion exercise is the second-day portion of the exercise to assess the impact to local populations from the hypothetical event. In addition, NRC routinely meets with state governments who have emergency preparedness zones (EPZs) in their states to maintain its relationship with these response partners. At these meetings, the NRC welcomes, and encourages local government participation.

However, the GAO report implies that NRC has limited or no interactions with local governments. We believe that the issue raised by the State of New York, and the counties around the Indian Point EPZ is that the local counties would prefer that NRC meet with them individually rather than include them at the NRC-state outreach meetings. This approach is not practical for two reasons. First, the NRC outreach effort with states is intended to enhance coordination with our response partners. This is why NRC encourages the local governments to be active participants in these meetings. Second, there are approximately 160 counties within EPZs around nuclear power plants. NRC does not have sufficient resources to individually meet with each of these counties, if they should request individual meetings.

In summary, GAO should clarify that NRC has, in place, an approach during emergencies to ensure accurate, consistent communications with the responsible organizations including local, State and Federal agencies. This communication is clearly identified in the emergency preparedness plans. GAO should also clarify that NRC has several mechanisms in place for non-emergency interactions with states and local governments. These include full and partial participation in approximately 10 emergency exercises a year, participating in exercises with states, and meeting with states and local governments together to maintain our relationship with these response partners.

See comment 1.

Details:

Page 18 - Recommendations for Executive Action.

- The recommendation that the Commissioners direct staff to assess the agency's position of communicating solely with state officials needs clarification. It is not clear whether GAO is referring to routine communications, communications during outreach program activities, or communications that would occur during a response to a radiological emergency.
- If GAO means during an emergency, effective event response relies on pre-established communication protocols for assuring information and actions are effectively coordinated. The New York state and county plans anticipate the most immediate source of information is the utility with the event. These plans designate the state as the point of contact for exchange of information and coordination with the federal agencies. Failure to follow this protocol could severely undermine the important lead role states play in assessing the information and providing coordination and support to the counties. Additionally, the licensee, state and counties have dedicated means to simultaneously update and exchange information with each other on a timely basis.
- For non-emergency activities, as discussed above, the NRC has a number of vehicles for ensuring communication and coordination. The report needs to recognize these mechanisms. In addition, the report can be more accurate by stating that the State of New York and the local counties want individual meetings instead of the current, coordinated approach used by NRC.

Page 14

The title statement: "...NRC does not communicate with those responsible for responding to radiological emergencies," is wrong.

- Ingestion pathway exercise outreach activities include the counties.
- Exercise planning meetings include the counties and EP conferences provide opportunities for the counties to meet informally with the NRC representatives.
- The NRC has participated with the state and the New York counties in the 10-mile EPZ of a nuclear plant in a facilitated tabletop exercise.
- NRC has met with the counties at their request (Westchester and Rockland legislatures and the Westchester School District Superintendents).
- The counties surrounding IP2 in the 10-mile EPZ are routinely sent notices of meetings and inspection reports related to correspondence between the NRC and utilities.

See comment 2.

See comment 3.

- During an emergency response, the NRC communications are directed through the state to ensure appropriate coordination of information and to avoid undermining the state's important role in direct support of the counties. In non-emergency situations, the NRC interacts on an as needed and as requested basis with the counties as well as with the state.
- NRC has routine outreach meetings with the states, and welcomes local government participation in these meetings.

Page 28

The second sentence of the NRC staff's response for the NRC and FEMA suggested action should be deleted since it refers to emergency response communication protocols and not to routine communications with offsite officials.

Page 30

In the "NRC only suggested action," the first sentence and last sentence of NRC staff's response should be deleted. They do not apply to routine communications with counties.

On various pages, such as at the bottom of page 3 and top of page 4, and also on pages 13 and 14, the report mixes NRC routine communications with NRC communications during an emergency response and is misleading. There is an important distinction between these functions as noted previously. We recommend, where the NRC and local government/county interface issue is discussed, the report clearly indicate which situation is being talked about.

Now on p. 29.

See comment 4.

Now on p. 31.

See comment 5.

See comment 6.

See comment 7.

2. The characterization that NRC did not hold Indian Point 2 accountable for fixing EP problems is incorrect. NRC has maintained a very strong regulatory posture at Indian Point 2 in the emergency preparedness area. The report should be clarified to reflect that the NRC took actions within our regulatory authority and framework commensurate with the safety significance of the EP problems at IP2.

Specifically, the statement on page 8 - first paragraph, "...when NRC does not hold utilities accountable for fixing them, problems can worsen. This is what happened at Indian Point 2," is incorrect and therefore misleading. For the past several years NRC has maintained a very strong and appropriate regulatory posture at Indian Point 2; this includes the emergency preparedness area. We based this conclusion on the following:

- At no time before or after the February 2000 event did NRC fail to take appropriate enforcement action at Indian Point.
- If before or after the February event there was a failure of Con Ed to perform essential emergency preparedness functions, in consultation with FEMA, we would have taken action. At no time were the performance issues that arose at the site of a nature that prevented protection of public health and safety. At no time, were performance problems of a nature that required a change in the Federal "reasonable assurance" determination.
- It is a matter of record that NRC inspection efforts before the February event were both extensive and effective in identifying performance issues.
- Between 1995 and 1999, NRC issued three violations related to Con Ed's emergency preparedness program consistent with our enforcement policy.
- NRC held management meetings with Con Ed before and after the February 2000 event to discuss NRC concerns with EP. The NRC obtained a commitment from the licensee to conduct another exercise for NRC evaluation in June 2000.
- In response to EP findings in 1998, NRC conducted exercise evaluations as special inspection initiative activities to confirm continued licensee emergency response capability during September 1999.
- It should be noted that the assessment of the performance problems encountered during February 2000 led to the issuance of three findings of "low to moderate safety significance". In other words the issues which have existed over the past several years, that manifested themselves during the February 2000 event, were not of a nature that would result in a loss of reasonable assurance that adequate protective measures could or would be taken in the event of a radiological emergency.

See comment 8.

3. The report should be clarified to more accurately reflect the conclusions of the April 2001 inspection report regarding EP performance issues that had been previously identified during the February 2000 event. The nature of issues observed by the April 2001 inspection team was clearly less significant than previous issues identified by the NRC, reflecting the improvements that were being made by the licensee. The team concluded that overall the emergency preparedness program was adequate and provided reasonable assurance that the organization could respond effectively to an emergency, and that program improvements were being made in Con Ed's efforts to address EP program weaknesses. This vital point is not reflected in the GAO report.

We believe that the statement on Page 7, first paragraph, on Page 10, second paragraph, "As a result, in an April 2001 inspection report, NRC identified emergency preparedness weaknesses similar to those that occurred before and during the February 2000 event," is incomplete and therefore misleading. We believe a better characterization is as follows: "Accordingly, in an April 2001 inspection report, the NRC observed that the remediation for some of the previously identified performance issues had not been fully effective. The team acknowledged that some corrective actions had been taken, that improvements were noted in a number of areas where performance issues had been previously identified. Overall the emergency preparedness program was adequate and provided reasonable assurance that the organization could respond effectively to an emergency." We believe this change is warranted based on the following:

- The 95003 inspection team, which conducted inspection documented in the April 2001 inspection report, concluded that overall the emergency preparedness program was adequate and provided reasonable assurance that the organization could respond effectively to an emergency, and that program improvements were being made as a result of Con Ed's efforts to address EP program weaknesses. This vital point is not reflected in the GAO report.
- A number of the 95003 inspection team observations were from drills that IP2 conducted to focus its corrective action efforts. As such, they were identified in the licensee's learning process.
- All of the findings of the April 2001 inspection report were of "very low safety significance." The nature of issues observed by the 95003 team was clearly less significant than previous issues thus reflecting the improvements that were being made by the licensee.

See comment 9.

See comment 10.

See comment 11.

Now on p. 5.  
See comment 12.

See comment 13.

See comment 14.

See comment 15.

## B. CORRECTIONS AND OTHER MINOR ISSUES

Throughout the document it is implied that FEMA and NRC conduct exercises. While the exercises are evaluated by the respective federal agencies, the exercises are actually conducted by the licensee and offsite authorities.

Page 1 Footnote: To clarify the footnote we request GAO add a phrase to last sentence - App. I shows "one of the four" steam generators....

Page 2 Results in Brief: Since some corrective actions were taken by Consolidated Edison; albeit, not fully effective, we request GAO change the phrase "that had gone uncorrected" to "that had gone largely uncorrected."

Page 4 In the section before "Background" which states: "Given that effective communication is critical to prepare for and respond to a radiological emergency..." we request that GAO clarify this section in order to distinguish communications being "critical" during emergencies ("respond to") and other actions in non-emergency situations ("prepare for") as being important.

The suggested change is as follows: "Given that effective communication is critical when responding to a radiological emergency and important in preparing for a radiological emergency, we are recommending ..."

Page 4 At the bottom of the page, change "four levels of emergencies" to "four emergency classification levels" in order to clarify the statement. Further, throughout the report...the word "emergency" is used... in relation to the alert event classification. Page 5 states that an alert is a low-level event that poses no threat to public health and safety. Therefore and in order to clarify, we also request GAO substitute "event" for "emergency" in context through-out the report.

Page 5 The first paragraph, last line, indicates there were 4 site area emergencies since 1981. This is incorrect; there have been 6 site area emergencies since 1981.

Page 5 In the 2nd paragraph in the third line, the report indicates that for each site the 50-mile EPZ needs to be exercised each 6 years. This should be clarified because the rule requires only that each state with a power plant (or within 50 miles of one) needs to conduct a post-plume exercise at least each 6 years.

Page 5 In the second paragraph, the statement about continuation of the practice to alternate exercises at the Indian Point site should be modified. Once IP2 and IP3 are owned and operated by the same licensee there would no longer be a need to rotate exercise participation. Therefore, the last line of paragraph should be corrected to read as follows: "According to NRC staff, if the proposed transfer of ownership is approved and completed the practice of alternating the off-site exercise would no longer be necessary at the Indian Point site since there would then be only one licensee."

See comment 16.

Page 5 In the last paragraph, the paragraph confuses drills and exercises. A suggested rewording of the last sentence would be: "According to NRC staff, the utilities usually conduct their biennial exercise as part of the offsite biennial exercise."

See comment 17.

Page 7 At the bottom of the page: "In 1999, NRC concluded that Consolidated Edison lacked the ability ...", should be modified to more correctly communicate the assessment of that Inspection Report.

Substitute this section with the following since it uses words similar to the cover letter of the inspection report (see underlined section): "In a 1999 inspection, the NRC identified two exercise weaknesses involving multiple exercise findings. These findings indicate an overall inability to detect and correct these problems and their causes. The inspectors noted an apparent ineffectiveness in the training process and a weak oversight of the emergency preparedness program. Due to the number of repetitive findings and importance of these exercise weaknesses, a management meeting was held with utility managers to discuss Consolidated Edison's assessment of the significance of the weaknesses, and their short and long term corrective actions. The NRC obtained a commitment from the licensee to conduct another exercise for NRC evaluation in June 2000."

See comment 18.

Page 12 The first paragraph is inaccurate and implies that the revised form indicates that a release above technical specifications poses a threat to the public. The form as depicted in Figure 2 only indicates if the release is above or below technical specifications. The paragraph should be reworded to read as follows: "As can be seen from figure 2, the form now clearly specifies that no release has occurred or if a release has occurred, whether it exceeds federally approved operating limits (technical specifications)."

Now on p. 23.  
See comment 19.

Page 22 The definitions and examples in Appendix II do not agree with those provided in NUREG-0654 and are inaccurate in some instances. For example the leak rate for an alert should be 50 gpm, not 75 gpm. A fire lasting more than 10 minutes is an unusual event not an alert. Increasing radiation levels in the plant would be an alert not an unusual event. In the GAO Report's definition of a site area emergency, the line "Any radioactive release is expected to stay within the plant's boundary" implies that the release would not go offsite. This is inaccurate and needs to be corrected to read "Any radioactive release is not expected to exceed the Environmental Protection Agency Protective Action Guides exposure levels except near the site boundary." The definitions and examples from NUREG-0654 should be used for clarity and uniformity between the documents.

Now on p. 24.  
See comment 20.

Page 23 The line "The focus of inspections is the 16 standards in the joint NRC/FEMA ..." is incorrect. It should read "The focus of inspections is the 16 standards identified in 10 CFR 50.47(b)."

Now on p. 25.  
See comment 21.

Page 24 In the second paragraph, the second sentence lists three examples and uses "and" between the second and third example indicating that the three items are linked. Each of these items would independently result in an increased level of NRC attention. Therefore, the "and" should be changed to "or".



Now on p. 25.  
See comment 22.

Page 24 In the last paragraph, the first sentence misrepresents the efforts taken to develop performance indicators. It should read "The NRC achieved stakeholder consensus to select the three performance indicators because they represented an appropriate set of objective measures to monitor safety significant emergency preparedness related activities. Several other emergency preparedness performance indicators were considered, however, these three were determined to be the best suited for use in the reactor oversight process."

Now on p. 26.  
See comment 23.

Page 25 While an availability performance indicator may enhance the current performance indicators, the current use of "reliability" in the performance indicator was based on and is consistent with existing FEMA guidance for siren testing and reporting.

Now on p. 29.  
See comment 24.

Page 28 With regard to the GAO suggested action of "NRC and FEMA", the "NRC staff's response" section, the NRC staff has discussed with GAO Staff that the NRC's budget does not include resources for extensive routine interface and coordination with local officials independent of state officials. However, we do not exclude counties from our interface/outreach efforts.

Now on p. 29.  
See comment 25.

Page 28 Related to the last suggested action regarding FEMA table top exercises, the NRC response should include a statement as follows: "The content and timing of final rulemaking activities for this initiative will be coordinated with FEMA's companion effort on rulemaking."

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The following are GAO's comments on the Nuclear Regulatory Commission's (NRC) letter dated July 13, 2001.

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## GAO's Comments

1. The report notes that the utility's radiological emergency preparedness plan identifies the process for notifying and communicating with federal, state, and local agencies and the media during an event. In addition, the counties' suggestion to interact and meet with NRC annually applies to nonemergency situations. Furthermore, the report clearly sets out some of the opportunities that the counties have to meet with NRC, including the annual meetings held to discuss all plants. As noted, however, emergency preparedness officials from the four counties did not believe that public meetings are the appropriate forums for government-to-government interactions. In addition, although the counties could be invited to the state outreach meetings that NRC attempts to hold with all the states every 5 years, NRC could not provide documentation that inviting the counties to such meetings is a routine practice. In fact, NRC staff told us that they were developing protocols for the state outreach program because no such documentation existed.
2. We revised the recommendation to clarify that it relates to routine, nonemergency communications. In addition, the recommendation is not intended to change the "coordinated approach" used by NRC to interact with the 31 states with commercial nuclear power plants. Rather, the recommendation is intended to supplement the actions that NRC takes. In addition, New York State and the counties did not say that they wanted to meet with NRC in lieu of the "coordinated approach" now used. Rather, since they are the entities primarily responsible for emergency preparedness—not the state—they want to meet and interact with NRC to obtain information about the status of the plant and any issues or problems that could affect their emergency preparedness programs.
3. We continue to believe that NRC does not routinely communicate with nonstate entities responsible for responding to radiological emergencies. NRC cites various activities in which local governments have communicated with or could communicate with it. For example, NRC notes that ingestion pathway exercises include the counties. However, FEMA conducts such exercises every 6 years and on a rotating basis among the three nuclear plant sites in New York State. As a result, an ingestion pathway exercise for Indian Point 2 would be held every 18 years. In addition, NRC said that it participated with

state and county officials in a tabletop exercise. On the basis of our discussions with NRC staff, this occurred only once in January 2001 and, at that time, the staff had not determined whether they would continue to attend the quarterly meetings held among New York State, county, and utility officials. Furthermore, NRC noted that the counties surrounding Indian Point 2 are routinely sent notices of meetings and inspection reports. But NRC has missed the point. The four New York counties did not say that they did not receive information about meetings or copies of inspection reports; rather, they said that they would like the opportunity to meet on a government-to-government basis with NRC. Being aware of public meetings and receiving copies of inspection reports cannot take the place of face-to-face interaction between NRC and the counties. Whatever NRC ultimately decides, one important consideration should be the large number of people that could be affected by a severe accident at Indian Point 2.

4. NRC does not routinely communicate with local jurisdictions either during an emergency or during nonemergency situations. Its "coordinated approach" relies on the state as a single point of contact. Therefore, we did not revise the report as NRC suggested.
5. We revised the report as NRC suggested.
6. See comment 1.
7. We revised the report to reflect that the September 1999 special inspection confirmed Consolidated Edison's capability to respond to an emergency and that the problems experienced during the February 2000 event did not result in the loss of reasonable assurance that adequate protective measures could or would be taken during an emergency. In addition, we continue to believe—and NRC's inspection reports and Consolidated Edison's self-assessment support—that the emergency preparedness problems at Indian Point 2 worsened after 1995. Finally, we never took a position on the safety significance of the emergency preparedness weaknesses that NRC identified at Indian Point 2. Such a determination is solely NRC's responsibility.
8. We added NRC's conclusion to the report; i.e., Consolidated Edison's emergency preparedness program would provide reasonable assurance to protect the public. However, we do not believe that it is misleading to state that Consolidated Edison's efforts to correct the emergency preparedness weaknesses that occurred before and during

the February 2000 event were incomplete and ineffective since in April 2001, NRC reported identified similar weaknesses.

9. We revised the report as NRC suggested.
10. We revised the report as NRC suggested.
11. We did not revise the report because the information that NRC suggested was already in the report.
12. We revised the report as NRC suggested.
13. We revised the report to include the information that NRC provided.
14. We did not revise the report because the information that NRC suggested was already in the report.
15. We revised the report to include the information that NRC suggested.
16. We revised the report as NRC suggested.
17. We did not revise the report as NRC suggested because the information was already in the report. In addition, the report later notes that NRC staff met with Consolidated Edison to discuss the agency's concerns about the emergency preparedness weaknesses at Indian Point 2.
18. We revised the report as NRC suggested.
19. We revised the report to include the information that NRC provided.
20. We revised the report as NRC suggested.
21. We revised the report as NRC suggested.
22. We revised the report to include the essence of the information that NRC provided.
23. We revised the report to include the information that NRC provided.
24. We did not revise the report because the information suggested by NRC was already in the report.
25. We revised the report to include the information that NRC provided.

# Appendix IX: Comments From the Federal Emergency Management Agency

Note: GAO's comments supplementing those in the report's text appear at the end of this appendix.



## Federal Emergency Management Agency

Washington, D.C. 20472

JUL 6 2001

Ms. Mary Ann Kruslicky  
Assistant Director  
Natural Resources and Environment  
United States General Accounting Office  
Washington, DC 20548

Dear Ms. Kruslicky:

Thank you for requesting the Federal Emergency Management Agency's (FEMA) comments on the General Accounting Office draft report entitled "Nuclear Regulation: Progress Made in Emergency Preparedness at Indian Point 2, but Additional Improvements Needed," dated June 25, 2001. On behalf of Director Allbaugh, I am pleased to forward FEMA's comments on the draft report as follows:

1. **Page 2, first sentence under "Results in Brief"** states that the Nuclear Regulatory Commission (NRC) had identified a number of emergency preparedness weaknesses at Indian Point.

**Comment:** This sentence should be changed to "...a number of **onsite** emergency preparedness weaknesses....," in order to make it clear that we are talking about onsite emergency preparedness. There are other instances in the report where it is unclear whether onsite or offsite emergency preparedness is being referenced, and these should also be clarified by the addition of the appropriate designation.

2. **Page 3, second paragraph:** "In particular, county officials said that since they are responsible for radiological emergency preparedness for Indian Point 2, NRC and FEMA should communicate directly with them."

**Comment:** Region II has seven radiological emergency preparedness (REP) employees: six are professional positions. A senior REP employee is designated as the Indian Point Site Manager. Although the individual designated as Indian Point Site Manager retired on June 2, 2001, the Regional Assistance Chair will act in this capacity on an interim basis. Each of the four counties has been assigned to a REP employee who serves in the capacity of team leader. Historically, New York State has always expressed a preference for all program matters to be channeled through the State, and for all meetings to include State representatives when the counties are present. This is not unusual and has been beneficial. This practice promotes clear communications, not the opposite. It should also be noted that formal review of the State and County plans was undertaken by FEMA and the Regional Assistance Committee in response to a written request by the Governor's Authorized

See comment 1.

See comment 2.

See comment 3.

Representative – the Chairman of the New York State Disaster Preparedness Commission. The State Emergency Management Office is a member of this commission and always participates in all meetings and other activities involving both FEMA and the counties. FEMA expects to increase its interactions with offsite emergency preparedness professionals at the State and at the local level in the coming years through more frequent Staff Assistance Visits by regional staff. This is a significant outcome of the REP strategic review.

3. **Page 5, third paragraph:** discussion of ingestion pathway exercises.

**Comment:** The responsibilities for addressing ingestion pathway issues are assigned principally to the State under the New York State plan. The Draft Report correctly notes on page 4, third paragraph: “In addition, state plans are required to address measures necessary to deal with the potential for the ingestion of radioactively contaminated foods and water out to a radius of 50 miles.”

The frequency of exercises in New York, because there are three sites involved, alternates between sites; however, the organizations and individuals with principal responsibility in this area participate in each exercise within each six-year cycle. The last Indian Point ingestion exercise was held on May 25 - 27, 1999.

4. **Page 6, footnote on Figure 1,** “The US Military Academy (USMA) at West Point, with a resident population of about 9,000, is located within the 10 mile emergency planning zone in Orange County. However the Academy is not covered by the county’s emergency preparedness plan.”

See comment 4.

**Comment:** The USMA is a Department of Defense facility and therefore is exempt from State and local emergency planning requirements; however, the Orange County plan does contain references to the academy and provides for the exchange of liaison officers to coordinate emergency response operations.

The Orange County plan lists the USMA as a special facility on page I-4; in Appendix P; and in Appendix Q. Appendix P states there is a total daytime population of 16,144; a total nighttime population of 10,526; a total weekend population of 12,526; a special event population of 42,000; and a graduation population of 30,000. Appendix Q identifies the Provost Marshall as the Point of Contact for emergency response operations.

It should also be noted that the USMA is connected to the Radiological Emergency Communication System (RECS), which is the primary means of notification between the utilities and off-site officials (State and all four counties) for a Radiological Emergency.

Now on p. 10.  
See comment 5.

5. **Page 9, Table 1, sixth corrective action taken:** “...In addition, the counties have agreed that they, rather than Consolidated Edison, will notify elected officials.”

See comment 6.

**Comment:** The counties always have been responsible for notifying their local elected officials; however, it is true that the means and methods used have been updated. In addition, this point also refers to a prior informal agreement between Consolidated Edison and the counties, which was never incorporated into any of the approved emergency response plans. For example, Consolidated Edison previously informally agreed to notify local elected officials in Westchester County as a courtesy. The reverse 911 system was established after the February 2000 Alert; whereas, the official Westchester County plan previously provided for the county to contact municipalities through the local Chiefs of Police.

6. **Page 13, third paragraph:** "...and FEMA said that some States limit it from communicating with local officials. However, NRC has not assessed the costs and benefits of meeting with local officials, and the four New York counties have not been privy to information concerning various FEMA initiatives that will impact their emergency preparedness programs."

**Comment:** The first sentence implies that FEMA does not have contact with the four counties involved. New York State does not restrict FEMA from communicating with local officials; however, it is accurate to say New York State has requested that contact with the four counties be coordinated in advance. In addition, the State normally schedules and participates in all meetings with FEMA and the four counties. The Chairman of the Region II Regional Assistance Committee advises that the four counties in the Indian Point area were briefed on FEMA's strategic initiatives at various meetings. In addition, FEMA discussed the work of its strategic planning initiative at annual National Radiological Emergency Preparedness Conferences, which are attended by local governments from across the country, and has made information available on the FEMA REP website and in the Federal Register. This said, FEMA plans to increase its interaction with the four counties through the enhanced program of Staff Assistance Visits which will be implemented in response to its strategic review of the REP program.

See comment 7.

7. **Page 16, first paragraph:** "Of NRC's four emergency levels, the general emergency is the only level that requires off-site monitoring and dose calculations. As a result, State and county officials suggested that it would be more realistic to periodically conduct FEMA's biennial exercises at the alert level, which they noted, and NRC's data confirm, occur more frequently than a general emergency, which has never occurred in this country."

**Comment:** The current and prior versions of the county plans require that Field Monitoring Teams are activated and deployed at the Alert level (Westchester County Radiological Emergency Response Plan, Procedure 3: Health; Section 4.0, Response Action: Alert). In other words, off-site monitoring and dose calculations are required prior to a General Emergency by the approved plan.

Each biennial exercise normally includes time at several different Emergency Classification Levels, including the Alert. The State and county plans call for

facilities to be activated at the Alert level and that is the normal starting point for each exercise or drill. The table below summarizes the specific timelines for exercises and drills at Indian Point and shows how much time has been spent at the Alert level in each exercise. The mustering drills are conducted only at the Alert level. The table does not include ingestion pathway exercises.

Exercise	Notice of Unusual Event	Alert	Site Area Emergency	General Emergency
May 1982	0735	0815	0906	1025
August 1983	1600	1800	2000	2145
November 1984	0730	0856	1037	1303
June 1986	0650	0815	1012	1105
March 1988	0722	0845	1032	1208
November 1990	0711	0817	1034	1218
September 1992	0726	0840	1015	1146
December 1993 Mustering Drill		2110		
June 1994	0900	1000	1117	1231
April 1996	0755	0857	1009	1135
June 1998	0830	0907	1042	1148
October 1999 Mustering Drill		1900		
November 2000		0918	1053	1121

See comment 8.

8. **Page 16, second paragraph:** “Nevertheless, county officials who participate in the exercises were not aware of the flexibility allowed by FEMA’s regulations. One reason for their lack of knowledge is that county officials who participate in the exercises do not participate in developing the exercise scenarios.”

**Comment:** County officials do participate in development of the Extent of Play guidance for each exercise and are aware of the options available through that mechanism. Scenario development is normally limited to a small team consisting of the State Exercise Director and representatives of the utility, who will not be evaluated in the exercise. FEMA has proposed changes in its exercise evaluation methodology, in part, to encourage the formulation of more creative exercise scenarios. We will consider the county officials’ suggestion that more time be spent at the alert level in formulating a final decision on the new exercise evaluation criteria.

See comment 9.

9. **Page 17, second paragraph** states that county officials were not aware of the particulars of the streamlined exercise process or how it would affect their actions during the exercise.



**Comment:** This statement does not adequately represent the measures FEMA has taken to ensure the widest possible distribution of strategic review-related information. In 1997, FEMA asked the REP State governors to designate stakeholders, including county representatives, to attend a strategic review stakeholders' meeting and regularly receive strategic review-related information. A Westchester County official was one of the Designated Government Stakeholders named. As such, he received an e-mail notification, with the document attached, whenever a strategic review document was posted on FEMA's REP Home Page for comment. FEMA also extensively advertised the existence of the REP Home Page, which contains a great deal of strategic review information. In addition, FEMA delivers a strategic review update every year during the National REP Conference, which is attended by representatives of State, tribal, and local governments and the utilities.

10. **Page 18, second paragraph:** recommendations for executive action.

**Comment:** The REP program is administered through the State and it would be inappropriate to deal exclusively with the counties. Please refer to the plan approval letter, which was addressed to the Governor of New York.

11. **Page 26, Appendix IV, sixth bullet, last sentence:** "FEMA expects to complete its evaluation of this issue by the end of calendar year 2001."

**Comment:** This should be revised to read: "FEMA expects to complete a Draft Report on this issue by the end of calendar year 2001."

12. **Page 28, Appendix VI, third action:** "New York State officials do not want FEMA to interact with local jurisdictions."

**Comment:** This is not accurate and was discussed above. New York State does not limit FEMA from communicating with local officials; however, it is accurate to say New York State has requested that contact with the four counties be coordinated in advance with the State. In addition, the State normally schedules and participates in all meetings with FEMA and the four counties.

13. **Page 29, Appendix VI:** Tabletop exercise issue:

**Comment:** FEMA does use tabletop exercises in the REP program, but only for Ingestion Pathway exercises. The specific history for New York and Indian Point is that tabletop exercises have not been used for plume pathway exercises, which require field monitoring teams to be activated and deployed. In addition, the last ingestion exercise at Indian Point – May 1999 – was a full participation exercise, which included Federal players. For example, US Department of Energy, FEMA and NRC all participated as players.

14. **Page 29, last entry on the table** states the following FEMA Response: "As part of its efforts to streamline its program, FEMA is considering a proposal to eliminate

5

See comment 10.

Now on p. 27.  
See comment 11.

Now on p. 29.  
See comment 12.

Now on p. 30.  
See comment 13.

Now on p. 31.  
See comment 14.

unannounced exercises because of opposition from off-site officials throughout the country.”

**Comment:** This entry should be deleted. FEMA will continue to hold unannounced drills--i.e., where the week, but not the day, of the drill is known--in conjunction with the fast breaker drills under proposed Evaluation Area Criterion 5.a.2.

15. **Page 30, the FEMA Response** that begins “In addition, if the Indian Point counties have issues or concerns...”

**Comment:** This response should be expanded by adding “ There is a mechanism in place for providing this bridge. FEMA’s Regional Assistance Committee (RAC) Chair is the head of the Regional Assistance Committee, which is composed of representatives of the Federal agencies with a role in radiological emergency preparedness.”

16. **Page 30, next-to-the-last paragraph:**

**Comment:** The number 19 should be changed to 24.

17. **Page 32, Table 5: “FEMA’s Initiatives and their Status”**

**Comment:** The Table should be prefaced with the following statement: “FEMA will monitor the course of these initiatives after implementation and will, if necessary, revise any initiative that is not attaining the desired result.”

18. **Table 5, “FEMA’s Initiatives and their Status”**

**Comment:** Table 5 should be updated, as enclosed, in order to reflect the current status of the initiatives. Also, the compilation of REP guidance will not be called the “One Book,” due to trademark concerns. References to the “One Book” should be changed to read “REP program manual.”

19. **Page 34, last two sentences:**

**Comment:** The sentences should be revised to read: “On June 11, 2001, FEMA published its report on all four pilot projects and the proposed exercise evaluation criteria in the Federal Register and allowed the public 60 days to comment. On the basis of the lessons learned from the pilot projects and public comments in response to the Federal Register notice, FEMA expects to revise the proposed exercise evaluation approach, if necessary, and implement it in October 2001.”

Now on p 31.  
See comment 15.

Now on p. 32.  
See comment 16.

See comment 17.

See comment 18.

See comment 19.

We appreciate the opportunity to review and comment before the report is issued in final form. If you have any questions, please feel free to contact Vanessa E. Quinn, Chief, Radiological Emergency Preparedness Branch, Technological Hazards Division, at (202) 646-3664.

Sincerely,



Lacy E. Shuter  
Assistant Director  
Readiness, Response and Recovery Directorate

Enclosure

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The following are GAO's comments on the Federal Emergency Management Agency's (FEMA) letter dated July 6, 2001.

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## GAO's Comments

1. Since we clearly state in the introduction of the report the differences in responsibilities between the NRC and FEMA for on- and off-site radiological emergency preparedness, respectively, we did not revise the report as FEMA suggested.
2. We revised the report to show that FEMA expects to increase its interaction with local officials in the coming years.
3. FEMA reiterated information provided in the draft report. As a result, we did not revise the report.
4. We revised the report to show that, as a Department of Defense facility, the U.S. Military Academy at West Point is exempt from state and local emergency-planning requirements but is connected to the emergency communication system that links Indian Point 2 with state and county officials. The Academy is developing a radiological response plan for its population and visitors. However, until the Department of Defense approves a plan, the population and visitors to the Academy are not provided the same level of protection as that provided to the public in Orange County.
5. FEMA provided historical information on the evolution of the "reverse 911" system implemented after the February 2000 event. However, table 1 shows the corrective actions following the event. As a result, we did not revise the report to incorporate the additional information that FEMA provided.
6. See comment 2.
7. We revised the report to show that the emergency plans for the four counties require them to conduct off-site monitoring and dose calculations at the alert level. This information would seem to provide support for the counties' suggestion to spend more time at the alert level during off-site exercises. In addition, although FEMA provided information on the time spent at the various emergency action levels for the biennial exercises conducted since May 1982, it did not provide an exercise completion time. We found, however, that the general emergency portion of the exercises conducted in April 1996, June 1998, and November 2000, ended between 3 and 4 hours after they started

while the time spent at the unusual event level ranged from 1/2 hour to 1 hour; at the alert level, from 1-1/4 hours to 1-3/4 hours; and at the site-area level, from about 1 hour to 1-1/2 hours. Therefore, FEMA's information supports the counties; that is, more time is spent at the general emergency level than at the three lower emergency levels during an exercise.

8. We revised the report to show that the county officials with whom we met did not participate in developing the exercise scenarios and that FEMA will consider the counties' suggestions when finalizing its new streamlined exercise process.
9. We revised the report to briefly discuss the actions that FEMA took to distribute information about the new streamlined exercise process. Nevertheless, FEMA's placing information on its Web page or discussing it at an annual conference were not successful in providing information about the new process to Westchester, Putnam, Orange, and Rockland county officials with whom we met.
10. We did not revise the report because our recommendation to FEMA did not say that the agency should deal "exclusively" with the counties.
11. We revised the report to include the information that FEMA suggested.
12. See comment 6.
13. We revised the report to show that FEMA has used tabletop exercises for the 50-mile ingestion pathway exercises.
14. We revised the report to show that FEMA will continue to conduct unannounced drills for a specific situation—a fast-breaking emergency.
15. FEMA reiterated the information provided in the draft report. As a result, we did not revise the report.
16. We revised the report as FEMA suggested.
17. We revised the report to include the information that FEMA suggested.
18. We revised the report as FEMA suggested.
19. We revised the report by adding "if necessary" as FEMA suggested.

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# Appendix X: Scope and Methodology

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To identify the emergency preparedness weaknesses at Indian Point 2 and the actions that Consolidated Edison has taken to resolve the weaknesses identified, we analyzed NRC's inspection reports and met with NRC staff in the Office of Nuclear Reactor Regulation and in Region I, King of Prussia, Pennsylvania, which is responsible for overseeing Indian Point 2. We also reviewed an August 2000 report by NRC's Office of the Inspector General, which discussed technical and emergency preparedness issues related to Indian Point 2 since at least 1997. We analyzed NRC's report on its planned actions to address the issues raised in the Office of the Inspector General's report. To put the weaknesses into perspective, we reviewed the relevant NRC regulations, policies, and procedures related to emergency preparedness and analyzed NRC's information on the number and types of emergencies that have occurred at nuclear power plants nationwide since 1981. We also reviewed a March 2000 report by the New York State Public Service Commission on the problems that occurred during the February 2000 event at Indian Point 2. To determine the actions that Consolidated Edison has taken to resolve the weaknesses identified, we analyzed relevant condition reports, root cause analyses, and sections of the 2000 and 2001 business plan concerning emergency preparedness improvements at Indian Point 2. We met with the Vice President for Engineering, Consolidated Edison, and the Chief Nuclear Officer and Emergency Preparedness Manager for Indian Point 2 to determine the company's commitment to following through on the identified corrective actions.

To determine the lessons learned from the emergency by the four Indian Point counties, we reviewed a March 2000 report by the New York State Public Service Commission on the problems that occurred during the emergency. We met with officials from New York State and Westchester, Putnam, Orange, and Rockland counties to obtain their perspective of the response taken during the emergency. We determined whether the response identified needed improvements in the counties' radiological emergency plans and the status of their actions to address the improvements identified. We also toured the state's and Rockland, Orange, and Putnam counties' emergency operations centers.

To determine suggestions for improving NRC's and FEMA's radiological emergency preparedness process beyond the actions already taken, we met with New York State; Westchester, Putnam, Orange, and Rockland county; and Consolidated Edison officials. We also met with FEMA headquarters officials in the Radiological Emergency Preparedness Branch and FEMA Region II in New York City and with NRC staff in the Office of Nuclear Reactor Regulation, Office of Public Affairs, and Incident

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Response Operations Office, to obtain their views on the suggestions offered. We also analyzed FEMA's documents related to its strategic review and the resulting 34 initiatives, the status of the initiatives, and FEMA's proposal to implement a streamlined exercise process.





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